NOISE IMPACT ANALYSIS

Cumberland Quarry

Proposed Quarry Operation

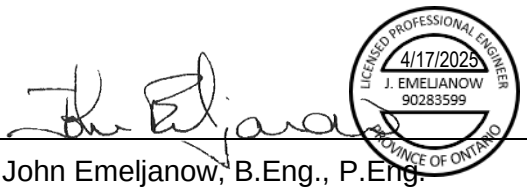
Township of Severn
Simcoe County

April 17th, 2025
Project: 113-041

Prepared for

Severn Aggregates Limited

Prepared by



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Version History

Version #	Date	Comments
1.0	September 14, 2017	Final – Issued to Client
2.0	April 17, 2025	Updated Final - To coordinate with latest Site Plans

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to:

- identify the potential noise sources;
- outline the sound exposure levels expected at surrounding noise sensitive neighbours during the operation of the quarry; and
- provide recommendations for mitigation measures required to meet the Ministry of the Environment, Conservation and Parks (MECP) environmental noise guidelines related to an Application for a Class A Category 2 Quarry Licence.

This noise impact assessment only evaluates the potential noise impacts from the steady noise sources operating on-site and does not evaluate the noise and vibration from blasting. Blasting has been addressed by others.

1.2 SITE

The proposed quarry site is just north of the northeast intersection of Nichols Line and Cambrian Road in the Township of Severn.

The site is identified as:

West Half Lots 12, 13 and 14

Concession 11

Geographic Township of Orillia, North Division

Township of Severn

See Figure 1 for a Key Plan.

The land uses in the general area include an existing quarry operation immediately to the west of the proposed Cumberland Quarry, an existing quarry operation to the east and rural residential and vacant wooded lands.

1.3 NOISE SENSITIVE RECEPTORS

See Figure 2 for the noise sensitive receptor locations. Receptors 1 (R1), 2 (R2), 3 (R3) and 5 (R5) are located to the east of the site. Receptor 4 (R4) is to the south of the site. These receptor locations are the closest to the proposed quarry operation. Other receptors are further removed and will benefit from increased distance attenuation and are expected to receive similar or lower resultant sound exposures from the proposed quarry operations.

The closest noise sensitive uses to the west and north are much farther removed and inherently expected to comply with the noise guideline limits.

2.0 PROGRAMME OF OPERATION

Initially, overburden will be removed to expose the rock. These activities should be relatively short lived. Overburden material will be stored on site and later used for the rehabilitation process.

Aggregate extraction will generally progress from the south to the north.

Normal activity at the site would involve a front end loader loading trucks with material for shipment off-site. The trucks would be loaded from stockpiles of aggregate at the permanent processing plant location at the southwest corner of the site. A maximum of 500,000 tonnes of aggregate per year could be shipped from the site. Based on this extraction limit, a worst case (i.e. maximum) of 15 truck loads of aggregate could be shipped in an hour.

Rock drilling will be done on the site to create holes which will accommodate the explosive material. Once an adequate number of holes have been created, they will be filled with explosives and the rock will be blasted away from the quarry face creating a “muck pile” at the base of the working face.

The processing of aggregate material from the muck pile will be done on the site. A permanent processing plant will be established at the southwest corner of the site. Material will be moved directly from the muck pile at the working face to the permanent processing plant using three dedicated haul trucks. The permanent processing plant will include crushing and screening plants. Figure 3 shows the operational plan, including the proposed extraction sequence.

It is expected that all equipment will operate atop the working face. Thus, an excavator will be used to load the dedicated haul trucks which will move the material to the permanent processing plant for processing.

A dimension stone operation is also proposed for the site. This will involve a front-end loader and excavator extracting stone and loading flat bed trucks to ship the dimensional stone off site.

To represent the worst case, the production quarry operations and dimension stone operations were assumed to be in the same location.

3.0 ENVIRONMENTAL NOISE GUIDELINES

The MECP noise guidelines require that the noise assessment determine the "predictable worst case" impacts. Thus, the assessment needs to evaluate the largest possible excess over the noise guideline limits based on the proposed operations in any hour of operation.

3.1 ON-SITE OPERATIONS

Noise sensitive receptors in this case are residential uses. The receptors to the east of the Cumberland Quarry site (i.e. R1, R2, R3 and R5) are considered to be in a "Class 3 Area", according to the MOE definition. A Class 3 Area is an area that has an existing acoustical environment dominated by the sounds of nature. The receptor to the south of the site (i.e. R4) is considered to be in a Class 2 Area due to the existing sound levels from truck traffic along the haul route to the Walker Industries and the MAQ Aggregates Inc. quarries to the west. See Glossary of Terms for definitions of Class 1, Class 2 and Class 3 areas.

The environmental sound level guidelines for Class 2 and 3 Areas are found in the MECP Publication NPC-300, *"Stationary and Transportation Sources – Approval and Planning".* For Class 2 and 3 Areas, the sound from the source (L_{eq} in any hour) should not exceed the ambient one hour L_{eq} at the receptors of concern, in the corresponding hour.

Notwithstanding the above, for a Class 2 Area, no mitigation is required for any source that does not exceed 50 dBA (one hour L_{eq}), at any off-site receptor of concern between the hours of 0700 and 1900 hours (daytime). Between 1900 and 0700 hours (nighttime), a 45 dBA limit is applicable. For a Class 3 Area, the daytime and nighttime noise guideline limits are 45 dBA and 40 dBA, respectively. These guideline sound limits are referred to as "exclusion limits".

Please note that the MECP terminology "stationary source" refers to the site as a whole, including the composite effect of all of the individual sound sources, even if the latter can actually move around the site. Thus, source, as referred to above, means the site (operation) as a whole.

3.2 OFF SITE HAUL ROUTE

There are no specific statutes, regulations, formal policies under the Planning Act or guidelines applicable to adding licensed motor vehicles to public roadways and dealing with noise.

4.0 APPLICABLE ENVIRONMENTAL NOISE GUIDELINES

To be conservative, the MOE exclusion limits have been applied for activities in the Cumberland Quarry. These are the most stringent applications of the noise guideline limits.

5.0 ANALYSIS

5.1 ON-SITE OPERATIONS

A quarry operation is a dynamic, continually changing process, that moves across the site. The site operations consist of various components:

- site preparation, including the removal of trees and the stripping of overburden;
- drilling and blasting;
- the transporting and processing of aggregate;
- the rehabilitation of the quarry; and
- miscellaneous construction activities.

Construction activities, including site preparation and rehabilitation, are not chronic and are excluded from the stationary noise source assessment as per MECP guidelines.

The hours of operation at the quarry are proposed to be:

- 06:00 to 18:00 hours Monday to Friday and 06:00 to 12:00 hours on Saturdays for loading and shipping of aggregate. Note that shipping and loading could occur outside of these hours at the request of the Province of Ontario;
- 07:00 to 18:00 hours Monday to Friday and 07:00 to 12:00 hours on Saturdays for extraction and processing (crushing, screening and washing);
- 08:00 to 18:00 hours Monday to Friday for blasting;
- 07:00 to 19:00 hours Monday to Friday for construction activities which includes stripping and rehabilitation; and
- No operations are permitted on public holidays.

A rock drill will operate on top of the working face to create blast holes. The blast will remove the rock from the working face and create a muck pile on the quarry floor. An excavator, also operating atop the working face, will load material from the muck pile at the base of the working face into the dedicated haul trucks. The trucks will haul the material to the permanent processing plant at the southwest corner of the site. The permanent processing plant will include crushing and screening plants. Stockpiles of final material will be located in this area. Two front end loaders will operate in the permanent plant location and will be used to load trucks which will ship the material off site. In addition to the above production quarry operation, a dimension stone operation will also occur on the site. This will involve a front end loader and an excavator which will extract the dimension stone and load it onto flat bed trucks for shipment off site. To be conservative, both the production and dimension quarrying operations were assumed to occur at the same location.

Note that other equipment with similar sound emission levels can be used on the site without impacting off site sound exposures. For example, an excavator can be used instead of a front end loader. However, the noise assessment is considered to reflect a worst case operating scenario.

The equipment sound emission levels used in our analysis are:

Type	Maximum Sound Emission Level (dBA)
Front End Loader	78 @ 15 m
Rock Drill	89@15 m
Excavator	80@15 m
Dedicated Haul Trucks	80@15 m
Permanent Processing Plant	90@15 m
Shipping Trucks	78@15 m

To ensure noise emissions comply with the recommendations of this report, we recommend that sound emission levels from equipment to be used on site be measured to ensure they do not exceed the levels outlined herein or, for equipment brought on site on an as-needed basis, they have appropriate portable Certificates of Approval (C's of A) or Environmental Compliance Approvals (ECA's).

To assess the noise impact at the noise sensitive receptor locations, a 3-D acoustical model of the proposed quarry operations was developed using the CadnaA Version 4.6 environmental noise modelling software. The model uses the prediction algorithms outlined in International Standards Organization Standard 9613-2:1996, "*Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*". The modelling technique is an approach that is acceptable to the MOE.

5.2 HAUL ROUTE

As indicated previously, the MECP do not have noise guidelines for adding licensed vehicle traffic to public roadways. However, the draft MECP *Noise Guidelines for Landfill Sites* does address haul routes. The haul route requirements outlined in the landfill guidelines are often used for quarry applications. It states that an access route shall be selected which will result in a minimum noise impact. It is understood in this case that Nichols Line has been designated as a Major Haul Route in the Severn Township Official Plan.

6.0 RESULTS

The worst case analysis results are provided in Table1. Note that for each receptor, the locations of the sources corresponding to the highest sound exposures may vary. The worst case unmitigated daytime sound exposure of 66 dBA is predicted at R1. At R2, R3, R4 and R5, worst case unmitigated sound exposures of 50 dBA, 49 dBA, 42 dBA, and 49 dBA, respectively, are predicted. Figure 4 shows the worst-case source locations and corresponding worst-case daytime sound exposures at each receptor.

The worst case nighttime sound exposures are also shown in Table 1. The nighttime operation involves only the loading of trucks from stockpiles at the permanent processing plant using up to two front end loaders and the shipping trucks coming to and leaving the site. The worst case nighttime sound exposure of 45 dBA is predicted at R1. At R2, R3, R4 and R5, worst case nighttime sound exposures of 38 dBA, 39 dBA, 33 dBA and 34 dBA are predicted.

The worst case daytime sound exposure at R4 and the worst case nighttime sound exposures at all receptors except R1 are in compliance with the MOE noise guideline limits. However, at R1, R2, R3 and R5, the unmitigated worst case daytime sound exposures and at R1 the unmitigated nighttime sound exposures exceed the MOE noise guideline limits by up to 21 dBA. Thus, noise mitigation measures are required.

6.1 MITIGATION RECOMMENDATIONS

The largest excess above the MOE noise guideline limits occurs at R1. This receptor is closest to the extraction area. In addition, the site is elevated relative to R1. There is, however, a lower existing ground elevation for part of the eastern boundary of the site. The elevation also increases across the quarry site from east to west.

One of the most significant noise sources is the drill. The drill must operate atop the working face. Drill technology has been improving with quieter drills becoming available. Thus, we recommend that a quieter drill having a maximum sound emission level of 80 dBA at 15 m, such as the Atlas Copco SmartRig fitted with a noise control shroud (product information in Appendix C) be used on this site.

Our analysis indicates that these mitigation measures are needed for the operations to comply with the MOE noise guideline limits:

- the rock drill have a maximum sound emission level of 80 dBA at 15 m;
- a 6.0 m high berm be constructed to the east of the permanent processing plant, as shown on Figure 5;
- maintain minimum 5.0 m high stockpiles no more than 30 m to the east of the permanent processing plant equipment;
- provide a perimeter berm along the eastern boundary of the site. The berm location is shown on Figure 5. This berm can be constructed in phases, as shown on Figures 6 to 12. Figures 6 to 12 show the minimum top of berm elevation that is required since the land is sloping to the east;
- rock drilling and hauling of material from the working face to the processing plant not occur at the same time within the hatched area shown on Figure 5; and
- dimension stone quarrying cannot occur at the same time rock drilling is occurring.

According to the MECP, a sound barrier means a wall, berm, wall/berm combination or similar structure. The minimum surface density (face weight) of a sound barrier is 20 kg/m2. The barrier must be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained. Sound barriers can be constructed from a variety of materials including wood, masonry, composites, etc., provided the above requirements are met. For this project, consideration is being given to using, berms, containers, straw bales and noise curtains for the sound barriers.

Any changes to the noise mitigation and/or equipment should be reviewed by a qualified acoustical consultant to ensure compliance with the MECP noise guideline limits.

6.2 OFF-SITE HAUL ROUTE

The haul route proposal is that trucks will use Nichols Line from the quarry site to access Highway 11. Nichols Line is a designated haul route and is already being used by Walker Industries as their haul route from their quarry immediately to the west of the proposed Cumberland Quarry and by MAQ Aggregates Inc. for their quarry to the southwest of Walker Industries quarry. Since there already is a significant amount of heavy truck traffic on Nichols Line, the expected noise impacts due to the addition of the Cumberland Quarry truck traffic is expected to be less than 3 dBA. This assumes a lower volume of truck traffic from the Cumberland Quarry as from the existing Walker Industries and MAQ quarries. The impact is considered insignificant.

Thus, based on the above, the exclusive use of Nichols Line as the haul route except for any local deliveries, is considered appropriate acoustically as insignificant noise impacts are predicted from the addition of the Cumberland Quarry truck traffic and there is a minimum number of noise sensitive receptors along this route.

7.0 RECOMMENDATIONS

1. The sound emission level for all pieces of equipment used for construction activities including site preparation and rehabilitation must comply with the limits outlined in MECP Publication NPC-115, “Construction Equipment”.
2. Back-up beepers are exempt from assessment by the MECP stationary noise source guidelines. However, to reduce off-site noise impacts, we recommend alternative technologies be used on all equipment operating at the site. Details regarding a potential alternative are included in Appendix C.
3. Sound emissions from equipment to be used on-site should be measured to confirm that they comply with the levels outlined within this report. For the rock drill, the maximum emission level is 80 dBA at 15 m.
4. Sound barriers be constructed as shown on Figure 5. The sound barriers may be constructed according to the timings shown in Figures 6 to 12, corresponding to each extraction phase indicated in the operational plan.
5. Minimum 5.0 m high stockpiles be maintained to the east of the permanent processing plant, as shown on Figure 5.
6. Rock drilling and the hauling of material from the working face to the permanent processing plant not occur at the same time within the highlighted area shown on Figure 5.
7. Dimension stone quarrying can only occur when rock drilling is not being done.
8. The quarry can operate Monday to Saturday during the daytime (0700 to 1800 hours) period. Loading and shipping can occur between 0600 and 1800 hours and outside of these hours if requested by the Province of Ontario.
9. Construction activities, including stripping and rehabilitation, should only occur during the daytime period (i.e., 0700 to 1900 hours) on Monday to Friday. There should be no construction on weekends or statutory holidays.

10. Off-site noise audit measurements be completed when drilling and processing are being done on the site to confirm the MECP noise guideline limits are met. The audit measurements must be done by a qualified acoustical engineer.
11. To ensure noise emissions comply with the recommendations of this report, sound emission levels from equipment to be used on site be measured to ensure they do not exceed the levels outlined herein or, for equipment brought to the site on an as-needed basis, they have appropriate C of A's or ECA's.
12. If other or new equipment is brought to the site, the sound emissions be checked to ensure the equipment is in compliance with this noise study.
13. If alternate noise mitigation measures are to be implemented, they be reviewed by a qualified acoustical consultant to ensure the MECP noise guideline limits will be met.

8.0 CONCLUSION

With the appropriate implementation of the mitigation measures outlined herein, the sound exposures from the worst case operations on the site will be in compliance with MECP noise guideline limits.

As the operation moves over the site, elevation, distance and sound exposure vary relative to off-site receptors. Thus, the noise analysis has been approached on the basis of determining worst case conditions to ensure that the data presented does not under-predict the potential off-site sound exposures. The interpretation of the sound exposure predictions must take this into account.

9.0 REFERENCES

1. "Model Municipal Noise Control By-Law", Final Report, Ontario Ministry of the Environment, August 1978.
2. "Noise Emission Levels for Vehicles in Ontario", Ontario Ministry of Transportation and Communications, November 1985, H05-85-02.
3. "Stationary and Transportation Sources - Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, October 2013.
4. "Noise Guidelines for Landfill Sites (Draft)", Ontario Ministry of the Environment, October 1998.
5. PC STAMSON 5.04, "Computer Program for Road Traffic Noise Assessment", Ontario Ministry of the Environment.
6. "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation", ISO 9613-2, December 15, 1996.

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GLOSSARY OF TERMS

Class 1 Area (MECP definition):

means an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the urban hum.

Class 2 Area (MECP definition):

means an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas, and in which a low ambient sound level, normally occurring only between 2300 and 0700 hours in Class 1 Areas, will typically be realized as early as 1900 hours.

Other characteristics which may indicate the presence of a Class 2 Area include:

- absence of urban hum between 1900 and 2300 hours;
- evening background sound level defined by natural environment and infrequency human activity; and
- no clearly audible sound from stationary sources other than from those under impact assessment.

Class 3 Area (MECP definition):

means a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as the following:

- a small community with less than 1000 population;
- agricultural area;
- a rural recreational area such as a cottage or a resort area; or
- a wilderness area.

Construction (MECP definition):

"Construction" includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earthmoving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith.

Construction Equipment (MECP definition):

"Construction equipment" means any equipment or device designed and intended for use in construction, or material handling, including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers,

compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment.

Conveyance (MECP definition):

"Conveyance" includes a vehicle, and any other device employed to transport a person or persons or goods from place to place but does not include any such device or vehicle if operated only within the premises of a person.

dB - Decibel:

See Sound (Pressure) Level.

dBA - A weighted decibel:

A nationally and internationally standardized frequency weighting applied to the sound level spectrum to approximate the sensitivity of the human hearing mechanism as a function of frequency (pitch).

L_{eq} - The energy equivalent continuous sound level:

The constant sound level over the time period in question, that results in the same total sound energy as the actually varying sound. Must be associated with a time period.

L_x - Statistical Sound Level Descriptor:

The sound level exceeded for x% of the time. For all practical purposes, L_{90} is the residual (lowest) ambient sound level.

Sound (Pressure) Level:

Measured in decibels (dB) it is the logarithmic ratio of the instantaneous energy of a sound to the energy at the threshold of hearing. Mathematically:

$$SPL\ \ (dB)\ \ =\ \ 20\ \ \log\ \ (\frac{p}{p_o})$$

where p is the pressure fue to the sound and p_o is the pressure at the threshold of hearing taken as 20 micro Pascals.

Stationary Source (MECP definition):

“Stationary source” means a source of sound which does not normally move from place to place and includes the premises of a person as one stationary source, unless the dominant source of sound on those premises is construction or a conveyance.

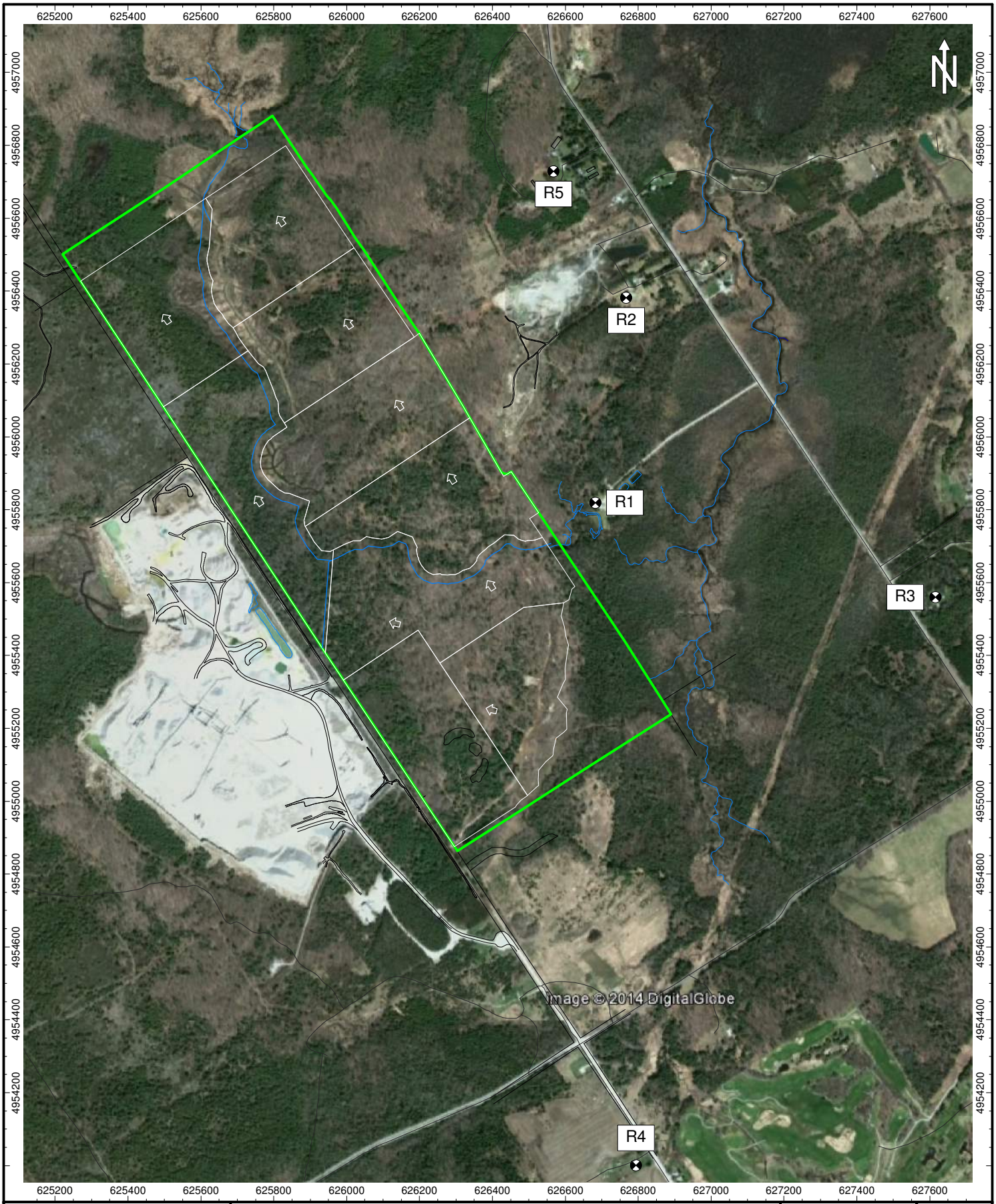
TABLE 1: WORST-CASE UNMITIGATED SOUND EXPOSURES

Receptor	Combined Daytime Sound Exposure(dBA)	MOE Daytime Noise Guideline Limit (dBA)	Combined Nighttime Sound Exposure(dBA)	MOE Nighttime Noise Guideline Limit (dBA)
R1	66	45	45	40
R2	50	45	38	40
R3	49	45	39	40
R4	42	50	33	45
R5	49	45	34	40

TABLE 2: WORST-CASE MITIGATED SOUND EXPOSURES

Receptor	Combined Daytime Sound Exposure(dBA)	MOE Daytime Noise Guideline Limit (dBA)	Combined Nighttime Sound Exposure(dBA)	MOE Nighttime Noise Guideline Limit (dBA)
R1	45	45	33	40
R2	42	45	30	40
R3	42	45	33	40
R4	39	50	32	45
R5	42	45	32	40

VALCOUSTICS Canada Ltd.	Title: Key Plan	Date: 2017-07-25	Figure: 1
	Project Name: Cumberland Quarry	Project No.: 113-041	



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Title	Date	Figure
Noise-Sensitive Receptor Locations	**2017-07-25**	**2**
Project Name: **Cumberland Quarry**	Project No.: **113-041**	

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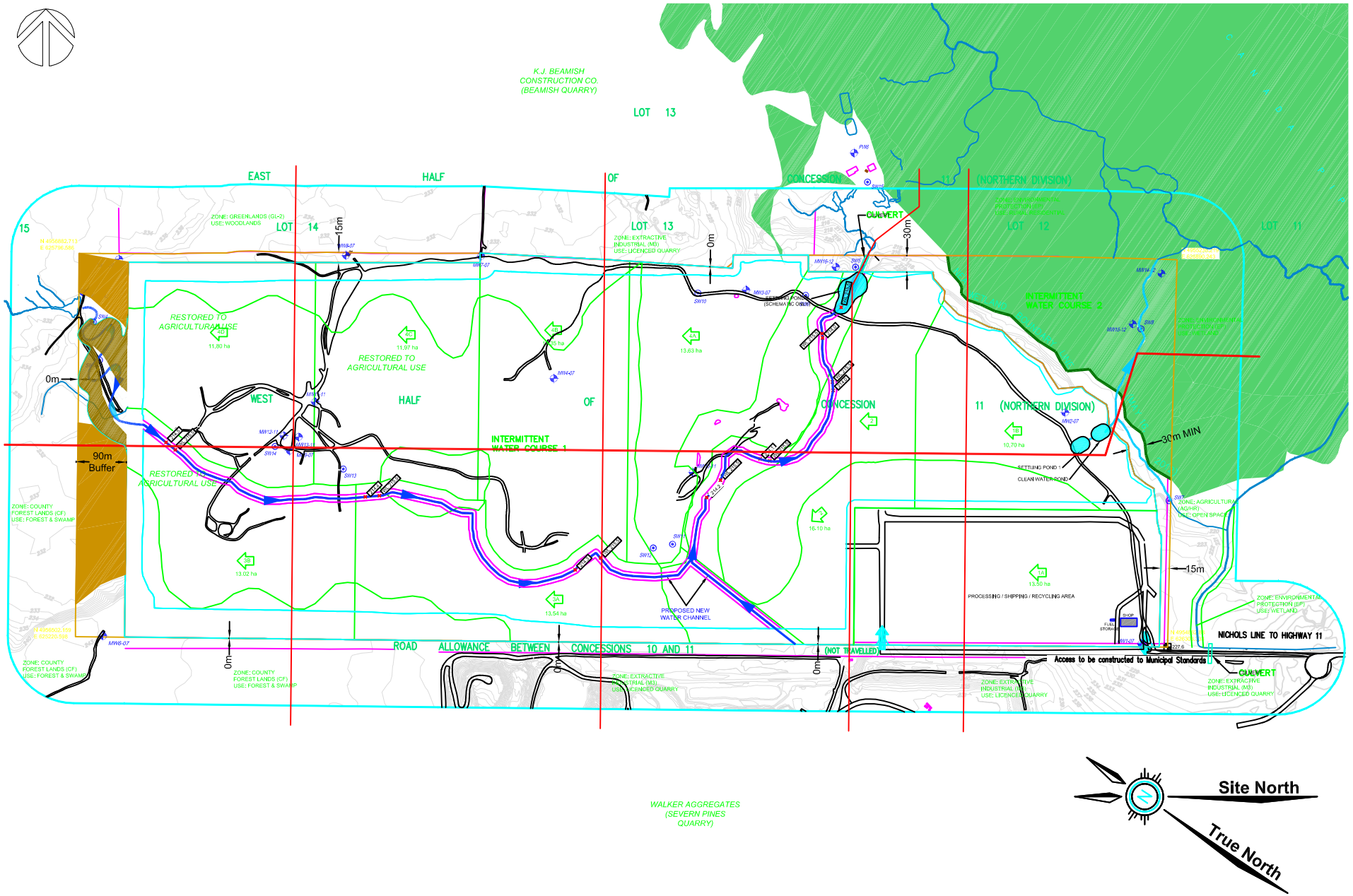
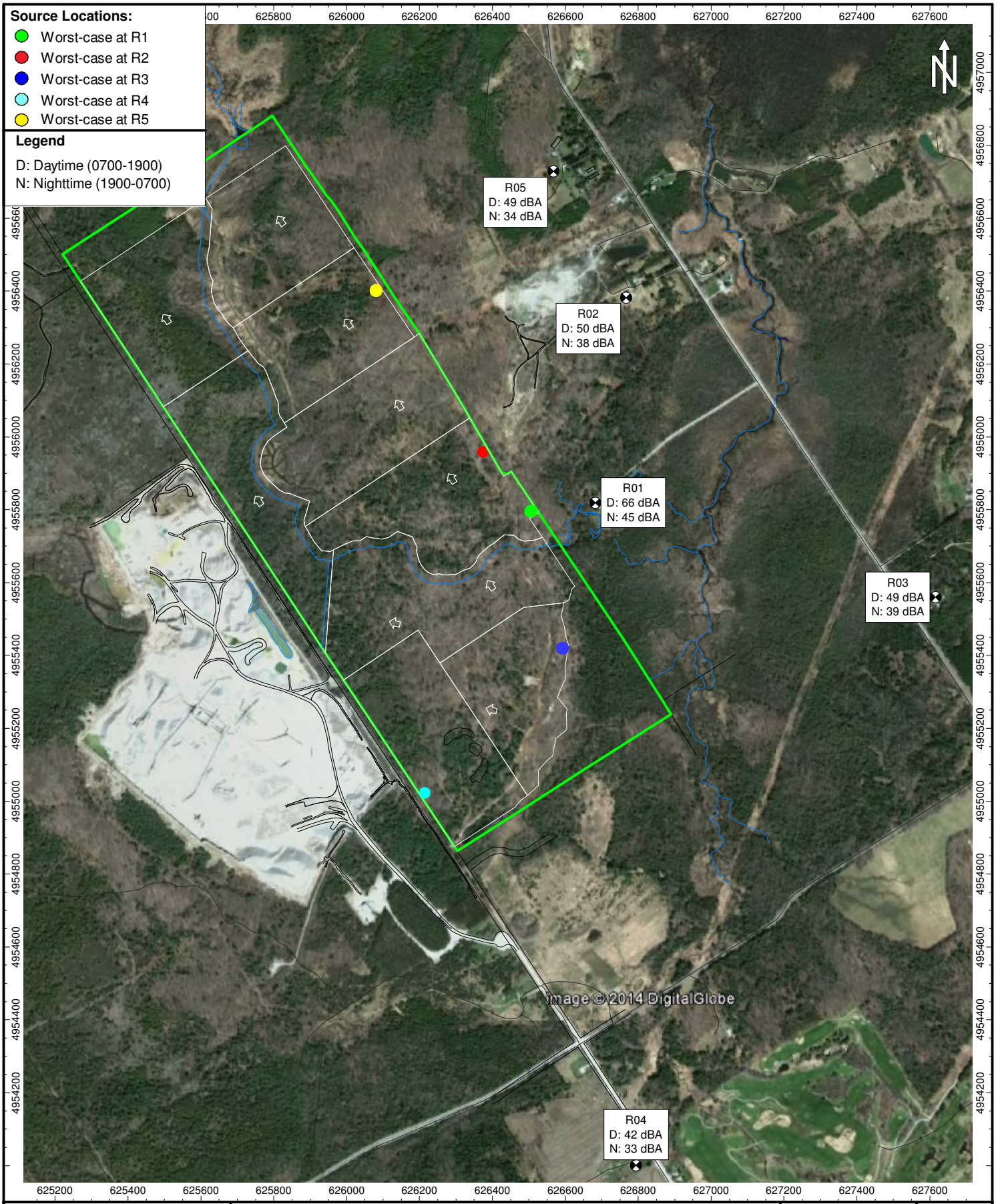
Date Plotted: 26.07.17



VALCOUSTICS Canada Ltd.	**Title** Operational Plan	**Date** 2017-07-25	**Figure** 3
	Project Name Cumberland Quarry	**Project No.** 113-041	



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Title	Date	Figure
Worst-Case Predicted Sound Levels (dBA) without Mitigation	**2017-07-25**	**4**
Project Name: **Cumberland Quarry**	Project No.: **113-041**	

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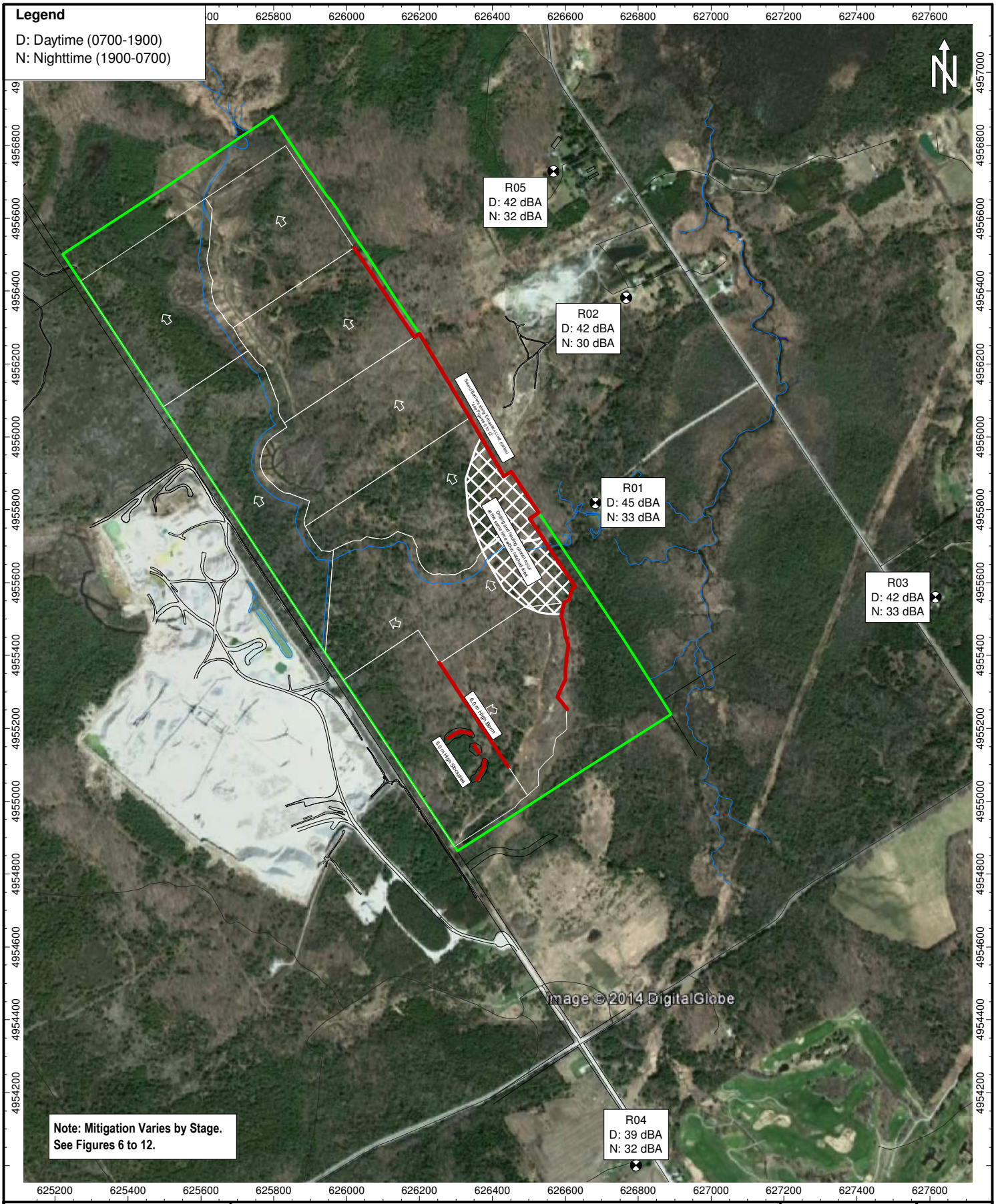

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Title	Date	Figure
Worst-Case Predicted Sound Levels (dBA) with Mitigation	**2017-07-25**	**5**
Project Name: **Cumberland Quarry**	Project No.: **113-041**	

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Title	Date	Figure
Berm Requirements - Stage 1	**2017-07-26**	**6**
Project Name	Project No.	
Cumberland Quarry	**113-041**	

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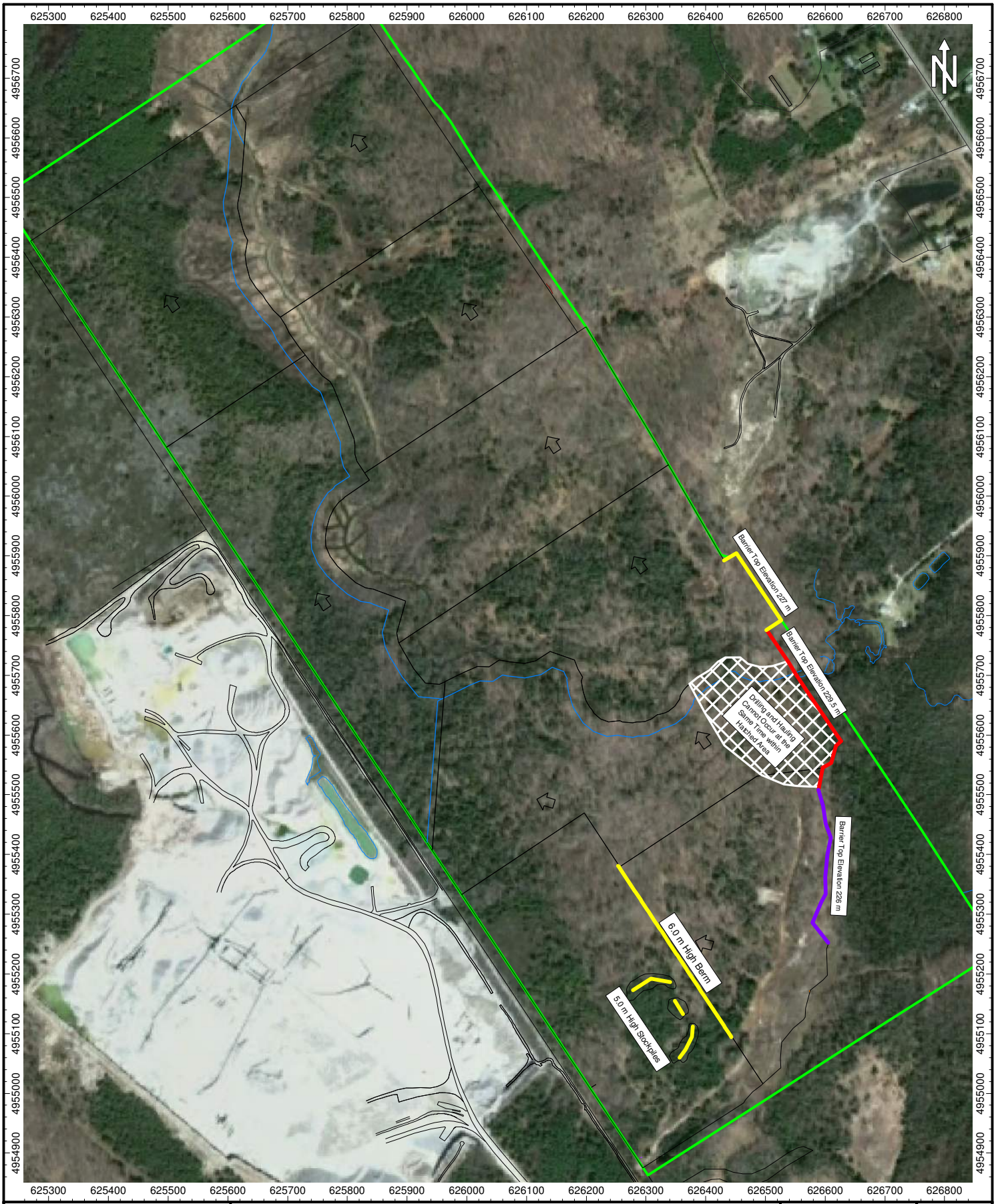

VALCOUSTICS Canada Ltd. consulting acoustical engineers	Title: **Barrier Requirements - Stages 2 to 4**	Date: **2017-07-26**	Figure: **7**
	Project Name: **Cumberland Quarry**	Project No.: **113-041**	

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Barrier Requirements - Stages 7 and 8	**2015-07-26**	**9**
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Title	Date	Figure
Barrier Requirements - Stages 11 and 12	**2017-07-26**	**11**
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Barrier Requirements - Stage 13	**2017-07-26**	**12**
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APPENDIX A
SAMPLE CALCULATIONS

Sound Power Levels

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Rock Drill	RD	Lw		0.0	123.0	124.0	119.0	120.0	116.0	114.0	109.0	102.0	121.8	128.5	VCL Database
Excavator	EXC	Lw		101.0	109.0	109.0	111.0	108.0	107.0	103.0	97.0	93.0	111.3	116.4	VCL Database
Articulated Haul Truck	HAUL	Lw		0.0	115.0	113.0	115.0	112.0	105.0	101.0	96.0	92.0	112.5	120.2	VCL Database
Processing Plant	PRCSG	Lw		110.0	118.0	122.0	114.0	116.0	115.0	115.0	114.0	109.0	121.4	125.9	VCL Database
Front End Loader	FEL	Lw		0.0	120.0	112.0	111.0	105.0	104.0	102.0	99.0	90.0	109.8	121.4	VCL Database
Truck Movements	VCLTrk	Lw		102.0	98.0	97.0	91.0	95.0	97.0	102.0	106.0	104.0	109.9	110.7	VCL Database

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	International
Max. Error (dB)	0.00
Max. Search Radius (m)	20000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	60.00
Reference Time Night (min)	60.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	225.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	1.00
Wind Speed for Dir. (m/s)	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Sample Calculations - Stage 7/8 Extraction (Unmitigated)

Point Source Table

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Front End Loader		FEL1	112.8	112.8	112.8	Lw	FEL+10*log10(2)		0.0	0.0	0.0							0.0		(none)	2.50	r	626309.75	4955091.32	225.50
Processing Plant		PRCSG	121.4	121.4	121.4	Lw	PRCSG		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.50	r	626277.98	4955092.81	226.50
Rock Drill		RD	121.8	121.8	121.8	Lw	RD		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	2.50	r	626515.20	4955795.43	225.37
Dimension Stone		DIM	115.6	115.6	115.6	Lw	EXC++FEL++EXC		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.50	r	626513.10	4955798.47	226.36

Line Source Table

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Shipments		xxSHIP	106.6	106.6	106.6	76.9	76.9	76.9	PWL-Pt	VCLTrk		0.0	0.0	0.0							0.0		(none)	10.0	10.0	10.0	20.0
Haul Trucks		xxHAUL	107.1	107.1	107.1	77.3	77.3	77.3	PWL-Pt	HAUL		0.0	0.0	0.0							0.0		(none)	3.0	3.0	3.0	10.0

Receiver
Name: R1
ID: R01
X: 626682.71
Y: 4955819.23
Z: 219.50

Point Source, ISO 9613, Name: "Rock Drill", ID: "RD"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2	626515.20	4955795.43	225.37	0	D	32	-39.4	0.0	0.0	0.0	0.0	55.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-92.0
2	626515.20	4955795.43	225.37	0	D	63	96.8	0.0	0.0	0.0	0.0	55.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	44.2
2	626515.20	4955795.43	225.37	0	D	125	107.9	0.0	0.0	0.0	0.0	55.6	0.1	4.5	0.0	0.0	0.0	0.0	0.0	47.8
2	626515.20	4955795.43	225.37	0	D	250	110.4	0.0	0.0	0.0	0.0	55.6	0.2	6.1	0.0	0.0	0.0	0.0	0.0	48.6
2	626515.20	4955795.43	225.37	0	D	500	116.8	0.0	0.0	0.0	0.0	55.6	0.3	0.8	0.0	0.0	0.0	0.0	0.0	60.1
2	626515.20	4955795.43	225.37	0	D	1000	116.0	0.0	0.0	0.0	0.0	55.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	59.8
2	626515.20	4955795.43	225.37	0	D	2000	115.2	0.0	0.0	0.0	0.0	55.6	1.6	-0.0	0.0	0.0	0.0	0.0	0.0	58.0
2	626515.20	4955795.43	225.37	0	D	4000	110.0	0.0	0.0	0.0	0.0	55.6	5.5	-0.0	0.0	0.0	0.0	0.0	0.0	48.9
2	626515.20	4955795.43	225.37	0	D	8000	100.9	0.0	0.0	0.0	0.0	55.6	19.8	-0.0	0.0	0.0	0.0	0.0	0.0	25.5

Point Source, ISO 9613, Name: "Front End Loader", ID: "FEL1"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5	626309.75	4955091.32	225.50	0	DEN	32	-36.4	0.0	0.0	0.0	0.0	69.3	0.0	-5.2	0.0	0.0	10.0	0.0	0.0	-110.4
5	626309.75	4955091.32	225.50	0	DEN	63	96.8	0.0	0.0	0.0	0.0	69.3	0.1	-5.2	0.0	0.0	10.0	0.0	0.0	22.7
5	626309.75	4955091.32	225.50	0	DEN	125	98.9	0.0	0.0	0.0	0.0	69.3	0.3	0.6	0.0	0.0	4.2	0.0	0.0	24.5
5	626309.75	4955091.32	225.50	0	DEN	250	105.4	0.0	0.0	0.0	0.0	69.3	0.9	-1.7	0.0	0.0	6.4	0.0	0.0	30.5
5	626309.75	4955091.32	225.50	0	DEN	500	104.8	0.0	0.0	0.0	0.0	69.3	1.6	-3.0	0.0	0.0	7.8	0.0	0.0	29.2
5	626309.75	4955091.32	225.50	0	DEN	1000	107.0	0.0	0.0	0.0	0.0	69.3	3.0	-3.1	0.0	0.0	7.8	0.0	0.0	30.0
5	626309.75	4955091.32	225.50	0	DEN	2000	106.2	0.0	0.0	0.0	0.0	69.3	7.9	-3.1	0.0	0.0	7.8	0.0	0.0	24.3
5	626309.75	4955091.32	225.50	0	DEN	4000	103.0	0.0	0.0	0.0	0.0	69.3	26.8	-3.1	0.0	0.0	7.8	0.0	0.0	2.2
5	626309.75	4955091.32	225.50	0	DEN	8000	91.9	0.0	0.0	0.0	0.0	69.3	95.6	-3.1	0.0	0.0	7.8	0.0	0.0	-77.7

Point Source, ISO 9613, Name: "Dimension Stone", ID: "DIM"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
37	626513.10	4955798.47	226.36	0	D	32	64.6	0.0	0.0	0.0	0.0	55.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	11.9
37	626513.10	4955798.47	226.36	0	D	63	94.4	0.0	0.0	0.0	0.0	55.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	41.8
37	626513.10	4955798.47	226.36	0	D	125	98.9	0.0	0.0	0.0	0.0	55.7	0.1	5.3	0.0	0.0	0.0	0.0	0.0	37.9
37	626513.10	4955798.47	226.36	0	D	250	107.2	0.0	0.0	0.0	0.0	55.7	0.2	4.1	0.0	0.0	0.0	0.0	0.0	47.2
37	626513.10	4955798.47	226.36	0	D	500	108.8	0.0	0.0	0.0	0.0	55.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	52.7
37	626513.10	4955798.47	226.36	0	D	1000	111.0	0.0	0.0	0.0	0.0	55.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	54.7
37	626513.10	4955798.47	226.36	0	D	2000	108.7	0.0	0.0	0.0	0.0	55.7	1.7	-0.0	0.0	0.0	0.0	0.0	0.0	51.3
37	626513.10	4955798.47	226.36	0	D	4000	103.5	0.0	0.0	0.0	0.0	55.7	5.6	-0.0	0.0	0.0	0.0	0.0	0.0	42.3
37	626513.10	4955798.47	226.36	0	D	8000	95.9	0.0	0.0	0.0	0.0	55.7	20.0	-0.0	0.0	0.0	0.0	0.0	0.0	20.2

Point Source, ISO 9613, Name: "Processing Plant", ID: "PRCSG"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
67	626277.98	4955092.81	226.50	0	D	32	70.6	0.0	0.0	0.0	0.0	69.4	0.0	-5.1	0.0	0.0	9.9	0.0	0.0	-3.6
67	626277.98	4955092.81	226.50	0	D	63	91.8	0.0	0.0	0.0	0.0	69.4	0.1	-5.1	0.0	0.0	9.9	0.0	0.0	17.5
67	626277.98	4955092.81	226.50	0	D	125	105.9	0.0	0.0	0.0	0.0	69.4	0.3	0.5	0.0	0.0	4.3	0.0	0.0	31.4
67	626277.98	4955092.81	226.50	0	D	250	105.4	0.0	0.0	0.0	0.0	69.4	0.9	-1.8	0.0	0.0	6.5	0.0	0.0	30.4
67	626277.98	4955092.81	226.50	0	D	500	112.8	0.0	0.0	0.0	0.0	69.4	1.6	-3.1	0.0	0.0	7.9	0.0	0.0	37.0
67	626277.98	4955092.81	226.50	0	D	1000	115.0	0.0	0.0	0.0	0.0	69.4	3.0	-3.1	0.0	0.0	7.9	0.0	0.0	37.8
67	626277.98	4955092.81	226.50	0	D	2000	116.2	0.0	0.0	0.0	0.0	69.4	8.0	-3.1	0.0	0.0	7.9	0.0	0.0	34.0
67	626277.98	4955092.81	226.50	0	D	4000	115.0	0.0	0.0	0.0	0.0	69.4	27.3	-3.1	0.0	0.0	7.9	0.0	0.0	13.6
67	626277.98	4955092.81	226.50	0	D	8000	107.9	0.0	0.0	0.0	0.0	69.4	97.2	-3.1	0.0	0.0	7.9	0.0	0.0	-63.5

Line Source, ISO 9613, Name: "Haul Trucks", ID: "xxHAUL"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	626427.62	4955692.95	226.85	0	DEN	32	-74.6	18.3	0.0	0.0	0.0	60.1	0.0	-3.8	0.0	0.0	0.0	0.0	0.0	-112.6

Line Source, ISO 9613, Name: "Haul Trucks", ID: "xxHAUL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	626427.62	4955692.95	226.85	0	DEN	63	53.6	18.3	0.0	0.0	0.0	60.1	0.0	-3.8	0.0	0.0	0.0	0.0	0.0	15.6
7	626427.62	4955692.95	226.85	0	DEN	125	61.7	18.3	0.0	0.0	0.0	60.1	0.1	2.5	0.0	0.0	0.0	0.0	0.0	17.3
7	626427.62	4955692.95	226.85	0	DEN	250	71.2	18.3	0.0	0.0	0.0	60.1	0.3	1.6	0.0	0.0	0.0	0.0	0.0	27.5
7	626427.62	4955692.95	226.85	0	DEN	500	73.6	18.3	0.0	0.0	0.0	60.1	0.5	-0.9	0.0	0.0	0.0	0.0	0.0	32.1
7	626427.62	4955692.95	226.85	0	DEN	1000	69.8	18.3	0.0	0.0	0.0	60.1	1.0	-1.1	0.0	0.0	0.0	0.0	0.0	28.1
7	626427.62	4955692.95	226.85	0	DEN	2000	67.0	18.3	0.0	0.0	0.0	60.1	2.8	-1.1	0.0	0.0	0.0	0.0	0.0	23.6
7	626427.62	4955692.95	226.85	0	DEN	4000	61.8	18.3	0.0	0.0	0.0	60.1	9.3	-1.1	0.0	0.0	0.0	0.0	0.0	11.8
7	626427.62	4955692.95	226.85	0	DEN	8000	55.7	18.3	0.0	0.0	0.0	60.1	33.3	-1.1	0.0	0.0	0.0	0.0	0.0	-18.3
11	626466.81	4955748.44	225.88	0	DEN	32	-74.6	18.3	0.0	0.0	0.0	58.1	0.0	-3.3	0.0	0.0	0.0	0.0	0.0	-111.2
11	626466.81	4955748.44	225.88	0	DEN	63	53.6	18.3	0.0	0.0	0.0	58.1	0.0	-3.3	0.0	0.0	0.0	0.0	0.0	17.0
11	626466.81	4955748.44	225.88	0	DEN	125	61.7	18.3	0.0	0.0	0.0	58.1	0.1	4.8	0.0	0.0	0.0	0.0	0.0	17.0
11	626466.81	4955748.44	225.88	0	DEN	250	71.2	18.3	0.0	0.0	0.0	58.1	0.2	6.4	0.0	0.0	0.0	0.0	0.0	24.7
11	626466.81	4955748.44	225.88	0	DEN	500	73.6	18.3	0.0	0.0	0.0	58.1	0.4	1.0	0.0	0.0	0.0	0.0	0.0	32.3
11	626466.81	4955748.44	225.88	0	DEN	1000	69.8	18.3	0.0	0.0	0.0	58.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	29.1
11	626466.81	4955748.44	225.88	0	DEN	2000	67.0	18.3	0.0	0.0	0.0	58.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	25.0
11	626466.81	4955748.44	225.88	0	DEN	4000	61.8	18.3	0.0	0.0	0.0	58.1	7.4	0.0	0.0	0.0	0.0	0.0	0.0	14.5
11	626466.81	4955748.44	225.88	0	DEN	8000	55.7	18.3	0.0	0.0	0.0	58.1	26.6	0.0	0.0	0.0	0.0	0.0	0.0	-10.7
22	626513.66	4955330.56	225.83	0	DEN	32	-74.6	20.9	0.0	0.0	0.0	65.3	0.0	-4.8	0.0	0.0	0.0	0.0	0.0	-114.2
22	626513.66	4955330.56	225.83	0	DEN	63	53.6	20.9	0.0	0.0	0.0	65.3	0.1	-4.8	0.0	0.0	0.0	0.0	0.0	13.9
22	626513.66	4955330.56	225.83	0	DEN	125	61.7	20.9	0.0	0.0	0.0	65.3	0.2	1.6	0.0	0.0	0.0	0.0	0.0	15.4
22	626513.66	4955330.56	225.83	0	DEN	250	71.2	20.9	0.0	0.0	0.0	65.3	0.5	-0.3	0.0	0.0	0.0	0.0	0.0	26.5
22	626513.66	4955330.56	225.83	0	DEN	500	73.6	20.9	0.0	0.0	0.0	65.3	1.0	-1.6	0.0	0.0	0.0	0.0	0.0	29.8
22	626513.66	4955330.56	225.83	0	DEN	1000	69.8	20.9	0.0	0.0	0.0	65.3	1.9	-1.6	0.0	0.0	0.0	0.0	0.0	25.1
22	626513.66	4955330.56	225.83	0	DEN	2000	67.0	20.9	0.0	0.0	0.0	65.3	5.0	-1.6	0.0	0.0	0.0	0.0	0.0	19.2
22	626513.66	4955330.56	225.83	0	DEN	4000	61.8	20.9	0.0	0.0	0.0	65.3	16.9	-1.6	0.0	0.0	0.0	0.0	0.0	2.1
22	626513.66	4955330.56	225.83	0	DEN	8000	55.7	20.9	0.0	0.0	0.0	65.3	60.4	-1.6	0.0	0.0	0.0	0.0	0.0	-47.5
27	626519.01	4955452.92	225.61	0	DEN	32	-74.6	20.9	0.0	0.0	0.0	63.1	0.0	-4.5	0.0	0.0	0.0	0.0	0.0	-112.4
27	626519.01	4955452.92	225.61	0	DEN	63	53.6	20.9	0.0	0.0	0.0	63.1	0.0	-4.5	0.0	0.0	0.0	0.0	0.0	15.8
27	626519.01	4955452.92	225.61	0	DEN	125	61.7	20.9	0.0	0.0	0.0	63.1	0.2	4.5	0.0	0.0	0.0	0.0	0.0	14.8
27	626519.01	4955452.92	225.61	0	DEN	250	71.2	20.9	0.0	0.0	0.0	63.1	0.4	4.6	0.0	0.0	0.0	0.0	0.0	24.0
27	626519.01	4955452.92	225.61	0	DEN	500	73.6	20.9	0.0	0.0	0.0	63.1	0.8	0.3	0.0	0.0	0.0	0.0	0.0	30.3
27	626519.01	4955452.92	225.61	0	DEN	1000	69.8	20.9	0.0	0.0	0.0	63.1	1.5	-0.4	0.0	0.0	0.0	0.0	0.0	26.6
27	626519.01	4955452.92	225.61	0	DEN	2000	67.0	20.9	0.0	0.0	0.0	63.1	3.9	-0.5	0.0	0.0	0.0	0.0	0.0	21.4
27	626519.01	4955452.92	225.61	0	DEN	4000	61.8	20.9	0.0	0.0	0.0	63.1	13.1	-0.5	0.0	0.0	0.0	0.0	0.0	6.9
27	626519.01	4955452.92	225.61	0	DEN	8000	55.7	20.9	0.0	0.0	0.0	63.1	46.9	-0.5	0.0	0.0	0.0	0.0	0.0	-33.0
30	626493.27	4955551.87	225.95	0	DEN	32	-74.6	19.8	0.0	0.0	0.0	61.3	0.0	-4.1	0.0	0.0	0.0	0.0	0.0	-112.1
30	626493.27	4955551.87	225.95	0	DEN	63	53.6	19.8	0.0	0.0	0.0	61.3	0.0	-4.1	0.0	0.0	0.0	0.0	0.0	16.1
30	626493.27	4955551.87	225.95	0	DEN	125	61.7	19.8	0.0	0.0	0.0	61.3	0.1	1.3	0.0	0.0	0.0	0.0	0.0	18.7
30	626493.27	4955551.87	225.95	0	DEN	250	71.2	19.8	0.0	0.0	0.0	61.3	0.3	-0.3	0.0	0.0	0.0	0.0	0.0	29.6
30	626493.27	4955551.87	225.95	0	DEN	500	73.6	19.8	0.0	0.0	0.0	61.3	0.6	-1.7	0.0	0.0	0.0	0.0	0.0	33.1
30	626493.27	4955551.87	225.95	0	DEN	1000	69.8	19.8	0.0	0.0	0.0	61.3	1.2	-1.7	0.0	0.0	0.0	0.0	0.0	28.7
30	626493.27	4955551.87	225.95	0	DEN	2000	67.0	19.8	0.0	0.0	0.0	61.3	3.2	-1.7	0.0	0.0	0.0	0.0	0.0	23.9
30	626493.27	4955551.87	225.95	0	DEN	4000	61.8	19.8	0.0	0.0	0.0	61.3	10.7	-1.7	0.0	0.0	0.0	0.0	0.0	11.2
30	626493.27	4955551.87	225.95	0	DEN	8000	55.7	19.8	0.0	0.0	0.0	61.3	38.3	-1.7	0.0	0.0	0.0	0.0	0.0	-22.5
33	626436.44	4955627.43	226.88	0	DEN	32	-74.6	19.8	0.0	0.0	0.0	60.9	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	-111.8
33	626436.44	4955627.43	226.88	0	DEN	63	53.6	19.8	0.0	0.0	0.0	60.9	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	16.4
33	626436.44	4955627.43	226.88	0	DEN	125	61.7	19.8	0.0	0.0	0.0	60.9	0.1	1.6	0.0	0.0	0.0	0.0	0.0	18.9
33	626436.44	4955627.43	226.88	0	DEN	250	71.2	19.8	0.0	0.0	0.0	60.9	0.3	-0.2	0.0	0.0	0.0	0.0	0.0	29.9
33	626436.44	4955627.43	226.88	0	DEN	500	73.6	19.8	0.0	0.0	0.0	60.9	0.6	-1.6	0.0	0.0	0.0	0.0	0.0	33.4
33	626436.44	4955627.43	226.88	0	DEN	1000	69.8	19.8	0.0	0.0	0.0	60.9	1.1	-1.6	0.0	0.0	0.0	0.0	0.0	29.1
33	626436.44	4955627.43	226.88	0	DEN	2000	67.0	19.8	0.0	0.0	0.0	60.9	3.0	-1.6	0.0	0.0	0.0	0.0	0.0	24.4
33	626436.44	4955627.43	226.88	0	DEN	4000	61.8	19.8	0.0	0.0	0.0	60.9	10.2	-1.6	0.0	0.0	0.0	0.0	0.0	12.0
33	626436.44	4955627.43	226.88	0	DEN	8000	55.7	19.8	0.0	0.0	0.0	60.9	36.5	-1.6	0.0	0.0	0.0	0.0	0.0	-20.4
60	626471.54	4955158.39	225.67	0	DEN	32	-74.6	23.7	0.0	0.0	0.0	67.8	0.0	-5.1	0.0	0.0	9.9	0.0	0.0	-123.5
60	626471.54	4955158.39	225.67	0	DEN	63	53.6	23.7	0.0	0.0	0.0	67.8	0.1	-5.1	0.0	0.0	9.9	0.0	0.0	4.6
60	626471.54	4955158.39	225.67	0	DEN	125	61.7	23.7	0.0	0.0	0.0	67.8	0.3	1.3	0.0	0.0	3.5	0.0	0.0	12.5
60	626471.54	4955158.39	225.67	0	DEN	250	71.2	23.7	0.0	0.0	0.0	67.8	0.7	-0.8	0.0	0.0	5.6	0.0	0.0	21.6
60	626471.54	4955158.39	225.67	0	DEN	500	73.6	23.7	0.0	0.0	0.0	67.8	1.3	-2.2	0.0	0.0	7.0	0.0	0.0	23.4
60	626471.54	4955158.39	225.67	0	DEN	1000	69.8	23.7	0.0	0.0	0.0	67.8	2.5	-2.2	0.0	0.0	7.0	0.0	0.0	18.4
60	626471.54	4955158.39	225.67	0	DEN	2000	67.0	23.7	0.0	0.0	0.0	67.8	6.7	-2.2	0.0	0.0	7.0	0.0	0.0	11.4
60	626471.54	4955158.39	225.67	0	DEN	4000	61.8	23.7	0.0	0.0	0.0	67.8	22.7	-2.2	0.0	0.0	7.0	0.0	0.0	-9.8
60	626471.54	4955158.39	225.67	0	DEN	8000	55.7	23.7	0.0	0.0	0.0	67.8	81.1	-2.2	0.0	0.0	7.0	0.0	0.0	-74.3
71	626381.95	4954999.26	226.45	0	DEN	32	-74.6	21.4	0.0	0.0	0.0	69.8	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-127.8

Line Source, ISO 9613, Name: "Haul Trucks", ID: "xxHAUL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
71	626381.95	4954999.26	226.45	0	DEN	63	53.6	21.4	0.0	0.0	0.0	69.8	0.1	-5.3	0.0	0.0	10.1	0.0	0.0	0.3
71	626381.95	4954999.26	226.45	0	DEN	125	61.7	21.4	0.0	0.0	0.0	69.8	0.4	0.9	0.0	0.0	3.9	0.0	0.0	8.1
71	626381.95	4954999.26	226.45	0	DEN	250	71.2	21.4	0.0	0.0	0.0	69.8	0.9	-1.4	0.0	0.0	6.1	0.0	0.0	17.1
71	626381.95	4954999.26	226.45	0	DEN	500	73.6	21.4	0.0	0.0	0.0	69.8	1.7	-2.8	0.0	0.0	7.6	0.0	0.0	18.7
71	626381.95	4954999.26	226.45	0	DEN	1000	69.8	21.4	0.0	0.0	0.0	69.8	3.2	-2.8	0.0	0.0	7.6	0.0	0.0	13.4
71	626381.95	4954999.26	226.45	0	DEN	2000	67.0	21.4	0.0	0.0	0.0	69.8	8.4	-2.8	0.0	0.0	7.6	0.0	0.0	5.4
71	626381.95	4954999.26	226.45	0	DEN	4000	61.8	21.4	0.0	0.0	0.0	69.8	28.6	-2.8	0.0	0.0	7.6	0.0	0.0	-20.0
71	626381.95	4954999.26	226.45	0	DEN	8000	55.7	21.4	0.0	0.0	0.0	69.8	102.1	-2.8	0.0	0.0	7.6	0.0	0.0	-99.6

Line Source, ISO 9613, Name: "Shipments", ID: "xxSHIP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
14	626427.68	4955693.08	226.85	0	DEN	32	29.6	18.3	0.0	0.0	0.0	60.1	0.0	-3.8	0.0	0.0	0.0	0.0	0.0	-8.3
14	626427.68	4955693.08	226.85	0	DEN	63	38.8	18.3	0.0	0.0	0.0	60.1	0.0	-3.8	0.0	0.0	0.0	0.0	0.0	0.8
14	626427.68	4955693.08	226.85	0	DEN	125	47.9	18.3	0.0	0.0	0.0	60.1	0.1	2.6	0.0	0.0	0.0	0.0	0.0	3.4
14	626427.68	4955693.08	226.85	0	DEN	250	49.4	18.3	0.0	0.0	0.0	60.1	0.3	1.8	0.0	0.0	0.0	0.0	0.0	5.6
14	626427.68	4955693.08	226.85	0	DEN	500	58.8	18.3	0.0	0.0	0.0	60.1	0.5	-0.8	0.0	0.0	0.0	0.0	0.0	17.3
14	626427.68	4955693.08	226.85	0	DEN	1000	64.0	18.3	0.0	0.0	0.0	60.1	1.0	-1.1	0.0	0.0	0.0	0.0	0.0	22.3
14	626427.68	4955693.08	226.85	0	DEN	2000	70.2	18.3	0.0	0.0	0.0	60.1	2.8	-1.1	0.0	0.0	0.0	0.0	0.0	26.8
14	626427.68	4955693.08	226.85	0	DEN	4000	74.0	18.3	0.0	0.0	0.0	60.1	9.3	-1.1	0.0	0.0	0.0	0.0	0.0	24.0
14	626427.68	4955693.08	226.85	0	DEN	8000	69.9	18.3	0.0	0.0	0.0	60.1	33.3	-1.1	0.0	0.0	0.0	0.0	0.0	-4.1
17	626466.99	4955748.84	225.88	0	DEN	32	29.6	18.3	0.0	0.0	0.0	58.1	0.0	-3.3	0.0	0.0	0.0	0.0	0.0	-6.9
17	626466.99	4955748.84	225.88	0	DEN	63	38.8	18.3	0.0	0.0	0.0	58.1	0.0	-3.3	0.0	0.0	0.0	0.0	0.0	2.2
17	626466.99	4955748.84	225.88	0	DEN	125	47.9	18.3	0.0	0.0	0.0	58.1	0.1	4.8	0.0	0.0	0.0	0.0	0.0	3.2
17	626466.99	4955748.84	225.88	0	DEN	250	49.4	18.3	0.0	0.0	0.0	58.1	0.2	6.4	0.0	0.0	0.0	0.0	0.0	2.9
17	626466.99	4955748.84	225.88	0	DEN	500	58.8	18.3	0.0	0.0	0.0	58.1	0.4	1.0	0.0	0.0	0.0	0.0	0.0	17.6
17	626466.99	4955748.84	225.88	0	DEN	1000	64.0	18.3	0.0	0.0	0.0	58.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	23.4
17	626466.99	4955748.84	225.88	0	DEN	2000	70.2	18.3	0.0	0.0	0.0	58.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	28.2
17	626466.99	4955748.84	225.88	0	DEN	4000	74.0	18.3	0.0	0.0	0.0	58.1	7.4	0.0	0.0	0.0	0.0	0.0	0.0	26.8
17	626466.99	4955748.84	225.88	0	DEN	8000	69.9	18.3	0.0	0.0	0.0	58.1	26.5	0.0	0.0	0.0	0.0	0.0	0.0	3.6
42	626513.66	4955330.56	225.83	0	DEN	32	29.6	20.9	0.0	0.0	0.0	65.3	0.0	-4.8	0.0	0.0	0.0	0.0	0.0	-10.0
42	626513.66	4955330.56	225.83	0	DEN	63	38.8	20.9	0.0	0.0	0.0	65.3	0.1	-4.8	0.0	0.0	0.0	0.0	0.0	-0.9
42	626513.66	4955330.56	225.83	0	DEN	125	47.9	20.9	0.0	0.0	0.0	65.3	0.2	1.6	0.0	0.0	0.0	0.0	0.0	1.6
42	626513.66	4955330.56	225.83	0	DEN	250	49.4	20.9	0.0	0.0	0.0	65.3	0.5	-0.3	0.0	0.0	0.0	0.0	0.0	4.8
42	626513.66	4955330.56	225.83	0	DEN	500	58.8	20.9	0.0	0.0	0.0	65.3	1.0	-1.6	0.0	0.0	0.0	0.0	0.0	15.0
42	626513.66	4955330.56	225.83	0	DEN	1000	64.0	20.9	0.0	0.0	0.0	65.3	1.9	-1.6	0.0	0.0	0.0	0.0	0.0	19.4
42	626513.66	4955330.56	225.83	0	DEN	2000	70.2	20.9	0.0	0.0	0.0	65.3	5.0	-1.6	0.0	0.0	0.0	0.0	0.0	22.4
42	626513.66	4955330.56	225.83	0	DEN	4000	74.0	20.9	0.0	0.0	0.0	65.3	16.9	-1.6	0.0	0.0	0.0	0.0	0.0	14.3
42	626513.66	4955330.56	225.83	0	DEN	8000	69.9	20.9	0.0	0.0	0.0	65.3	60.4	-1.6	0.0	0.0	0.0	0.0	0.0	-33.3
48	626519.01	4955452.92	225.61	0	DEN	32	29.6	20.9	0.0	0.0	0.0	63.1	0.0	-4.5	0.0	0.0	0.0	0.0	0.0	-8.2
48	626519.01	4955452.92	225.61	0	DEN	63	38.8	20.9	0.0	0.0	0.0	63.1	0.0	-4.5	0.0	0.0	0.0	0.0	0.0	1.0
48	626519.01	4955452.92	225.61	0	DEN	125	47.9	20.9	0.0	0.0	0.0	63.1	0.2	4.5	0.0	0.0	0.0	0.0	0.0	1.0
48	626519.01	4955452.92	225.61	0	DEN	250	49.4	20.9	0.0	0.0	0.0	63.1	0.4	4.6	0.0	0.0	0.0	0.0	0.0	2.2
48	626519.01	4955452.92	225.61	0	DEN	500	58.8	20.9	0.0	0.0	0.0	63.1	0.8	0.3	0.0	0.0	0.0	0.0	0.0	15.6
48	626519.01	4955452.92	225.61	0	DEN	1000	64.0	20.9	0.0	0.0	0.0	63.1	1.5	-0.4	0.0	0.0	0.0	0.0	0.0	20.8
48	626519.01	4955452.92	225.61	0	DEN	2000	70.2	20.9	0.0	0.0	0.0	63.1	3.9	-0.5	0.0	0.0	0.0	0.0	0.0	24.6
48	626519.01	4955452.92	225.61	0	DEN	4000	74.0	20.9	0.0	0.0	0.0	63.1	13.1	-0.5	0.0	0.0	0.0	0.0	0.0	19.1
48	626519.01	4955452.92	225.61	0	DEN	8000	69.9	20.9	0.0	0.0	0.0	63.1	46.9	-0.5	0.0	0.0	0.0	0.0	0.0	-18.7
52	626493.27	4955551.87	225.95	0	DEN	32	29.6	19.8	0.0	0.0	0.0	61.3	0.0	-4.1	0.0	0.0	0.0	0.0	0.0	-7.9
52	626493.27	4955551.87	225.95	0	DEN	63	38.8	19.8	0.0	0.0	0.0	61.3	0.0	-4.1	0.0	0.0	0.0	0.0	0.0	1.3
52	626493.27	4955551.87	225.95	0	DEN	125	47.9	19.8	0.0	0.0	0.0	61.3	0.1	1.3	0.0	0.0	0.0	0.0	0.0	4.9
52	626493.27	4955551.87	225.95	0	DEN	250	49.4	19.8	0.0	0.0	0.0	61.3	0.3	-0.3	0.0	0.0	0.0	0.0	0.0	7.8
52	626493.27	4955551.87	225.95	0	DEN	500	58.8	19.8	0.0	0.0	0.0	61.3	0.6	-1.7	0.0	0.0	0.0	0.0	0.0	18.3
52	626493.27	4955551.87	225.95	0	DEN	1000	64.0	19.8	0.0	0.0	0.0	61.3	1.2	-1.7	0.0	0.0	0.0	0.0	0.0	22.9
52	626493.27	4955551.87	225.95	0	DEN	2000	70.2	19.8	0.0	0.0	0.0	61.3	3.2	-1.7	0.0	0.0	0.0	0.0	0.0	27.1
52	626493.27	4955551.87	225.95	0	DEN	4000	74.0	19.8	0.0	0.0	0.0	61.3	10.7	-1.7	0.0	0.0	0.0	0.0	0.0	23.4
52	626493.27	4955551.87	225.95	0	DEN	8000	69.9	19.8	0.0	0.0	0.0	61.3	38.3	-1.7	0.0	0.0	0.0	0.0	0.0	-8.3
56	626436.44	4955627.43	226.88	0	DEN	32	29.6	19.8	0.0	0.0	0.0	60.9	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	-7.5
56	626436.44	4955627.43	226.88	0	DEN	63	38.8	19.8	0.0	0.0	0.0	60.9	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	1.6
56	626436.44	4955627.43	226.88	0	DEN	125	47.9	19.8	0.0	0.0	0.0	60.9	0.1	1.6	0.0	0.0	0.0	0.0	0.0	5.1
56	626436.44	4955627.43	226.88	0	DEN	250	49.4	19.8	0.0	0.0	0.0	60.9	0.3	-0.2	0.0	0.0	0.0	0.0	0.0	8.1
56	626436.44	4955627.43	226.88	0	DEN	500	58.8	19.8	0.0	0.0	0.0	60.9	0.6	-1.6	0.0	0.0	0.0	0.0	0.0	18.6
56	626436.44	4955627.43	226.88	0	DEN	1000	64.0	19.8	0.0	0.0	0.0	60.9	1.1	-1.6	0.0	0.0	0.0	0.0	0.0	23.3

Line Source, ISO 9613, Name: "Shipments", ID: "xxSHIP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
56	626436.44	4955627.43	226.88	0	DEN	2000	70.2	19.8	0.0	0.0	0.0	60.9	3.0	-1.6	0.0	0.0	0.0	0.0	0.0	27.6
56	626436.44	4955627.43	226.88	0	DEN	4000	74.0	19.8	0.0	0.0	0.0	60.9	10.2	-1.6	0.0	0.0	0.0	0.0	0.0	24.2
56	626436.44	4955627.43	226.88	0	DEN	8000	69.9	19.8	0.0	0.0	0.0	60.9	36.5	-1.6	0.0	0.0	0.0	0.0	0.0	-6.2
64	626471.54	4955158.39	225.67	0	DEN	32	29.6	23.7	0.0	0.0	0.0	67.8	0.0	-5.1	0.0	0.0	9.9	0.0	0.0	-19.3
64	626471.54	4955158.39	225.67	0	DEN	63	38.8	23.7	0.0	0.0	0.0	67.8	0.1	-5.1	0.0	0.0	9.9	0.0	0.0	-10.2
64	626471.54	4955158.39	225.67	0	DEN	125	47.9	23.7	0.0	0.0	0.0	67.8	0.3	1.3	0.0	0.0	3.5	0.0	0.0	-1.3
64	626471.54	4955158.39	225.67	0	DEN	250	49.4	23.7	0.0	0.0	0.0	67.8	0.7	-0.8	0.0	0.0	5.6	0.0	0.0	-0.2
64	626471.54	4955158.39	225.67	0	DEN	500	58.8	23.7	0.0	0.0	0.0	67.8	1.3	-2.2	0.0	0.0	7.0	0.0	0.0	8.6
64	626471.54	4955158.39	225.67	0	DEN	1000	64.0	23.7	0.0	0.0	0.0	67.8	2.5	-2.2	0.0	0.0	7.0	0.0	0.0	12.6
64	626471.54	4955158.39	225.67	0	DEN	2000	70.2	23.7	0.0	0.0	0.0	67.8	6.7	-2.2	0.0	0.0	7.0	0.0	0.0	14.6
64	626471.54	4955158.39	225.67	0	DEN	4000	74.0	23.7	0.0	0.0	0.0	67.8	22.7	-2.2	0.0	0.0	7.0	0.0	0.0	2.4
64	626471.54	4955158.39	225.67	0	DEN	8000	69.9	23.7	0.0	0.0	0.0	67.8	81.1	-2.2	0.0	0.0	7.0	0.0	0.0	-60.1
73	626381.95	4954999.26	226.45	0	DEN	32	29.6	21.4	0.0	0.0	0.0	69.8	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-23.6
73	626381.95	4954999.26	226.45	0	DEN	63	38.8	21.4	0.0	0.0	0.0	69.8	0.1	-5.3	0.0	0.0	10.1	0.0	0.0	-14.5
73	626381.95	4954999.26	226.45	0	DEN	125	47.9	21.4	0.0	0.0	0.0	69.8	0.4	0.9	0.0	0.0	3.9	0.0	0.0	-5.6
73	626381.95	4954999.26	226.45	0	DEN	250	49.4	21.4	0.0	0.0	0.0	69.8	0.9	-1.4	0.0	0.0	6.1	0.0	0.0	-4.7
73	626381.95	4954999.26	226.45	0	DEN	500	58.8	21.4	0.0	0.0	0.0	69.8	1.7	-2.8	0.0	0.0	7.6	0.0	0.0	3.9
73	626381.95	4954999.26	226.45	0	DEN	1000	64.0	21.4	0.0	0.0	0.0	69.8	3.2	-2.8	0.0	0.0	7.6	0.0	0.0	7.6
73	626381.95	4954999.26	226.45	0	DEN	2000	70.2	21.4	0.0	0.0	0.0	69.8	8.4	-2.8	0.0	0.0	7.6	0.0	0.0	8.6
73	626381.95	4954999.26	226.45	0	DEN	4000	74.0	21.4	0.0	0.0	0.0	69.8	28.6	-2.8	0.0	0.0	7.6	0.0	0.0	-7.8
73	626381.95	4954999.26	226.45	0	DEN	8000	69.9	21.4	0.0	0.0	0.0	69.8	102.1	-2.8	0.0	0.0	7.6	0.0	0.0	-85.4

Sample Calculations - Stage 7/8 Extraction (Mitigated)

Point Source Table

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Front End Loader		FEL1	112.8	112.8	112.8	Lw	FEL+10*log10(2)		0.0	0.0	0.0							0.0		(none)	2.50	r	626309.75	4955091.32	225.50
Processing Plant		PRCSG	121.4	121.4	121.4	Lw	PRCSG		0.0	0.0	0.0							0.0		(none)	3.50	r	626277.98	4955092.81	226.50
Rock Drill		DRILL	111.5	111.5	111.5	Lw	RD	111.5	0.0	0.0	0.0							0.0		(none)	2.50	r	626324.58	4955778.75	228.42

Line Source Table

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Shipments		SHIP	106.2	106.2	106.2	82.9	82.9	82.9	PWL-Pt	VCLTrk		0.0	0.0	0.0							0.0		(none)	40.0	40.0	40.0	20.0
Haul Trucks		HAUL_R1	105.9	105.9	105.9	77.3	77.3	77.3	PWL-Pt	HAUL		0.0	0.0	0.0							0.0		(none)	3.0	3.0	3.0	10.0

Receiver
Name: R1
ID: R01
X: 626682.71
Y: 4955819.23
Z: 219.50

Point Source, ISO 9613, Name: "Processing Plant", ID: "PRCSG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2	626277.98	4955092.81	226.50	0	DEN	32	70.6	0.0	0.0	0.0	0.0	69.4	0.0	-5.1	0.0	0.0	10.0	0.0	0.0	-3.7
2	626277.98	4955092.81	226.50	0	DEN	63	91.8	0.0	0.0	0.0	0.0	69.4	0.1	-5.1	0.0	0.0	10.1	0.0	0.0	17.3
2	626277.98	4955092.81	226.50	0	DEN	125	105.9	0.0	0.0	0.0	0.0	69.4	0.3	0.5	0.0	0.0	4.7	0.0	0.0	31.0
2	626277.98	4955092.81	226.50	0	DEN	250	105.4	0.0	0.0	0.0	0.0	69.4	0.9	-1.8	0.0	0.0	7.2	0.0	0.0	29.7
2	626277.98	4955092.81	226.50	0	DEN	500	112.8	0.0	0.0	0.0	0.0	69.4	1.6	-3.1	0.0	0.0	9.2	0.0	0.0	35.7
2	626277.98	4955092.81	226.50	0	DEN	1000	115.0	0.0	0.0	0.0	0.0	69.4	3.0	-3.1	0.0	0.0	10.2	0.0	0.0	35.5
2	626277.98	4955092.81	226.50	0	DEN	2000	116.2	0.0	0.0	0.0	0.0	69.4	8.0	-3.1	0.0	0.0	11.6	0.0	0.0	30.2
2	626277.98	4955092.81	226.50	0	DEN	4000	115.0	0.0	0.0	0.0	0.0	69.4	27.3	-3.1	0.0	0.0	13.6	0.0	0.0	7.8
2	626277.98	4955092.81	226.50	0	DEN	8000	107.9	0.0	0.0	0.0	0.0	69.4	97.2	-3.1	0.0	0.0	16.0	0.0	0.0	-71.6

Point Source, ISO 9613, Name: "Rock Drill", ID: "DRILL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5	626324.58	4955778.75	228.42	0	DEN	32	-49.7	0.0	0.0	0.0	0.0	62.1	0.0	-4.3	0.0	0.0	9.1	0.0	0.0	-116.6
5	626324.58	4955778.75	228.42	0	DEN	63	86.5	0.0	0.0	0.0	0.0	62.1	0.0	-4.3	0.0	0.0	9.1	0.0	0.0	19.5
5	626324.58	4955778.75	228.42	0	DEN	125	97.6	0.0	0.0	0.0	0.0	62.1	0.1	1.5	0.0	0.0	3.4	0.0	0.0	30.5
5	626324.58	4955778.75	228.42	0	DEN	250	100.1	0.0	0.0	0.0	0.0	62.1	0.4	-0.3	0.0	0.0	5.3	0.0	0.0	32.6
5	626324.58	4955778.75	228.42	0	DEN	500	106.5	0.0	0.0	0.0	0.0	62.1	0.7	-1.6	0.0	0.0	7.0	0.0	0.0	38.4
5	626324.58	4955778.75	228.42	0	DEN	1000	105.7	0.0	0.0	0.0	0.0	62.1	1.3	-1.7	0.0	0.0	7.4	0.0	0.0	36.5
5	626324.58	4955778.75	228.42	0	DEN	2000	104.9	0.0	0.0	0.0	0.0	62.1	3.5	-1.7	0.0	0.0	8.2	0.0	0.0	32.7
5	626324.58	4955778.75	228.42	0	DEN	4000	99.7	0.0	0.0	0.0	0.0	62.1	11.8	-1.7	0.0	0.0	9.5	0.0	0.0	17.9
5	626324.58	4955778.75	228.42	0	DEN	8000	90.6	0.0	0.0	0.0	0.0	62.1	42.1	-1.7	0.0	0.0	11.3	0.0	0.0	-23.3

Point Source, ISO 9613, Name: "Front End Loader", ID: "FEL1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
10	626309.75	4955091.32	225.50	0	DEN	32	-36.4	0.0	0.0	0.0	0.0	69.3	0.0	-5.2	0.0	0.0	10.2	0.0	0.0	-110.6
10	626309.75	4955091.32	225.50	0	DEN	63	96.8	0.0	0.0	0.0	0.0	69.3	0.1	-5.2	0.0	0.0	10.4	0.0	0.0	22.3
10	626309.75	4955091.32	225.50	0	DEN	125	98.9	0.0	0.0	0.0	0.0	69.3	0.3	0.6	0.0	0.0	4.9	0.0	0.0	23.8
10	626309.75	4955091.32	225.50	0	DEN	250	105.4	0.0	0.0	0.0	0.0	69.3	0.9	-1.7	0.0	0.0	7.7	0.0	0.0	29.2
10	626309.75	4955091.32	225.50	0	DEN	500	104.8	0.0	0.0	0.0	0.0	69.3	1.6	-3.0	0.0	0.0	10.1	0.0	0.0	26.9
10	626309.75	4955091.32	225.50	0	DEN	1000	107.0	0.0	0.0	0.0	0.0	69.3	3.0	-3.1	0.0	0.0	11.6	0.0	0.0	26.2
10	626309.75	4955091.32	225.50	0	DEN	2000	106.2	0.0	0.0	0.0	0.0	69.3	7.9	-3.1	0.0	0.0	13.6	0.0	0.0	18.5
10	626309.75	4955091.32	225.50	0	DEN	4000	103.0	0.0	0.0	0.0	0.0	69.3	26.8	-3.1	0.0	0.0	16.0	0.0	0.0	-6.0
10	626309.75	4955091.32	225.50	0	DEN	8000	91.9	0.0	0.0	0.0	0.0	69.3	95.6	-3.1	0.0	0.0	18.7	0.0	0.0	-88.6

Line Source, ISO 9613, Name: "Haul Trucks", ID: "HAUL_R1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
13	626282.24	4955751.23	228.94	0	DEN	32	-74.6	18.4	0.0	0.0	0.0	63.2	0.0	-4.4	0.0	0.0	9.2	0.0	0.0	-124.2
13	626282.24	4955751.23	228.94	0	DEN	63	53.6	18.4	0.0	0.0	0.0	63.2	0.0	-4.4	0.0	0.0	9.3	0.0	0.0	3.9
13	626282.24	4955751.23	228.94	0	DEN	125	61.7	18.4	0.0	0.0	0.0	63.2	0.2	1.5	0.0	0.0	3.4	0.0	0.0	11.9
13	626282.24	4955751.23	228.94	0	DEN	250	71.2	18.4	0.0	0.0	0.0	63.2	0.4	-0.4	0.0	0.0	5.3	0.0	0.0	21.0
13	626282.24	4955751.23	228.94	0	DEN	500	73.6	18.4	0.0	0.0	0.0	63.2	0.8	-1.8	0.0	0.0	6.9	0.0	0.0	22.9
13	626282.24	4955751.23	228.94	0	DEN	1000	69.8	18.4	0.0	0.0	0.0	63.2	1.5	-1.8	0.0	0.0	7.2	0.0	0.0	18.0
13	626282.24	4955751.23	228.94	0	DEN	2000	67.0	18.4	0.0	0.0	0.0	63.2	3.9	-1.8	0.0	0.0	7.9	0.0	0.0	12.2
13	626282.24	4955751.23	228.94	0	DEN	4000	61.8	18.4	0.0	0.0	0.0	63.2	13.3	-1.8	0.0	0.0	8.9	0.0	0.0	-3.4
13	626282.24	4955751.23	228.94	0	DEN	8000	55.7	18.4	0.0	0.0	0.0	63.2	47.5	-1.8	0.0	0.0	10.4	0.0	0.0	-45.2
17	626235.02	4955690.93	229.50	0	DEN	32	-74.6	19.4	0.0	0.0	0.0	64.4	0.0	-4.6	0.0	0.0	9.4	0.0	0.0	-124.4
17	626235.02	4955690.93	229.50	0	DEN	63	53.6	19.4	0.0	0.0	0.0	64.4	0.1	-4.6	0.0	0.0	9.4	0.0	0.0	3.8
17	626235.02	4955690.93	229.50	0	DEN	125	61.7	19.4	0.0	0.0	0.0	64.4	0.2	2.8	0.0	0.0	2.0	0.0	0.0	11.7
17	626235.02	4955690.93	229.50	0	DEN	250	71.2	19.4	0.0	0.0	0.0	64.4	0.5	1.4	0.0	0.0	3.4	0.0	0.0	20.9
17	626235.02	4955690.93	229.50	0	DEN	500	73.6	19.4	0.0	0.0	0.0	64.4	0.9	-1.0	0.0	0.0	5.9	0.0	0.0	22.8

Line Source, ISO 9613, Name: "Haul Trucks", ID: "HAUL_R1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
17	626235.02	4955690.93	229.50	0	DEN	1000	69.8	19.4	0.0	0.0	0.0	64.4	1.7	-1.2	0.0	0.0	6.2	0.0	0.0	18.1
17	626235.02	4955690.93	229.50	0	DEN	2000	67.0	19.4	0.0	0.0	0.0	64.4	4.5	-1.2	0.0	0.0	6.4	0.0	0.0	12.4
17	626235.02	4955690.93	229.50	0	DEN	4000	61.8	19.4	0.0	0.0	0.0	64.4	15.3	-1.2	0.0	0.0	6.7	0.0	0.0	-3.9
17	626235.02	4955690.93	229.50	0	DEN	8000	55.7	19.4	0.0	0.0	0.0	64.4	54.4	-1.2	0.0	0.0	7.3	0.0	0.0	-49.8
32	626182.08	4955506.34	230.77	0	DEN	32	-74.6	20.3	0.0	0.0	0.0	66.4	0.0	-4.9	0.0	0.0	9.7	0.0	0.0	-125.6
32	626182.08	4955506.34	230.77	0	DEN	63	53.6	20.3	0.0	0.0	0.0	66.4	0.1	-4.9	0.0	0.0	9.7	0.0	0.0	2.6
32	626182.08	4955506.34	230.77	0	DEN	125	61.7	20.3	0.0	0.0	0.0	66.4	0.2	0.5	0.0	0.0	4.2	0.0	0.0	10.5
32	626182.08	4955506.34	230.77	0	DEN	250	71.2	20.3	0.0	0.0	0.0	66.4	0.6	-1.6	0.0	0.0	6.3	0.0	0.0	19.6
32	626182.08	4955506.34	230.77	0	DEN	500	73.6	20.3	0.0	0.0	0.0	66.4	1.1	-2.9	0.0	0.0	7.8	0.0	0.0	21.5
32	626182.08	4955506.34	230.77	0	DEN	1000	69.8	20.3	0.0	0.0	0.0	66.4	2.2	-3.0	0.0	0.0	7.8	0.0	0.0	16.6
32	626182.08	4955506.34	230.77	0	DEN	2000	67.0	20.3	0.0	0.0	0.0	66.4	5.7	-3.0	0.0	0.0	7.9	0.0	0.0	10.2
32	626182.08	4955506.34	230.77	0	DEN	4000	61.8	20.3	0.0	0.0	0.0	66.4	19.3	-3.0	0.0	0.0	8.0	0.0	0.0	-8.7
32	626182.08	4955506.34	230.77	0	DEN	8000	55.7	20.3	0.0	0.0	0.0	66.4	69.0	-3.0	0.0	0.0	8.2	0.0	0.0	-64.8
37	626228.05	4955306.92	231.35	0	DEN	32	-74.6	19.2	0.0	0.0	0.0	67.7	0.0	-5.1	0.0	0.0	10.0	0.0	0.0	-128.1
37	626228.05	4955306.92	231.35	0	DEN	63	53.6	19.2	0.0	0.0	0.0	67.7	0.1	-5.1	0.0	0.0	10.2	0.0	0.0	-0.1
37	626228.05	4955306.92	231.35	0	DEN	125	61.7	19.2	0.0	0.0	0.0	67.7	0.3	0.3	0.0	0.0	5.2	0.0	0.0	7.5
37	626228.05	4955306.92	231.35	0	DEN	250	71.2	19.2	0.0	0.0	0.0	67.7	0.7	-1.8	0.0	0.0	7.8	0.0	0.0	16.0
37	626228.05	4955306.92	231.35	0	DEN	500	73.6	19.2	0.0	0.0	0.0	67.7	1.3	-3.2	0.0	0.0	10.1	0.0	0.0	16.9
37	626228.05	4955306.92	231.35	0	DEN	1000	69.8	19.2	0.0	0.0	0.0	67.7	2.5	-3.2	0.0	0.0	11.5	0.0	0.0	10.4
37	626228.05	4955306.92	231.35	0	DEN	2000	67.0	19.2	0.0	0.0	0.0	67.7	6.6	-3.2	0.0	0.0	13.5	0.0	0.0	1.6
37	626228.05	4955306.92	231.35	0	DEN	4000	61.8	19.2	0.0	0.0	0.0	67.7	22.4	-3.2	0.0	0.0	15.8	0.0	0.0	-21.8
37	626228.05	4955306.92	231.35	0	DEN	8000	55.7	19.2	0.0	0.0	0.0	67.7	80.1	-3.2	0.0	0.0	18.5	0.0	0.0	-88.2
40	626219.65	4955361.84	230.98	0	DEN	32	-74.6	14.3	0.0	0.0	0.0	67.3	0.0	-5.0	0.0	0.0	9.8	0.0	0.0	-132.4
40	626219.65	4955361.84	230.98	0	DEN	63	53.6	14.3	0.0	0.0	0.0	67.3	0.1	-5.0	0.0	0.0	9.8	0.0	0.0	-4.2
40	626219.65	4955361.84	230.98	0	DEN	125	61.7	14.3	0.0	0.0	0.0	67.3	0.3	0.3	0.0	0.0	4.5	0.0	0.0	3.7
40	626219.65	4955361.84	230.98	0	DEN	250	71.2	14.3	0.0	0.0	0.0	67.3	0.7	-1.8	0.0	0.0	6.6	0.0	0.0	12.8
40	626219.65	4955361.84	230.98	0	DEN	500	73.6	14.3	0.0	0.0	0.0	67.3	1.3	-3.1	0.0	0.0	7.9	0.0	0.0	14.6
40	626219.65	4955361.84	230.98	0	DEN	1000	69.8	14.3	0.0	0.0	0.0	67.3	2.4	-3.1	0.0	0.0	7.9	0.0	0.0	9.7
40	626219.65	4955361.84	230.98	0	DEN	2000	67.0	14.3	0.0	0.0	0.0	67.3	6.3	-3.1	0.0	0.0	7.9	0.0	0.0	2.9
40	626219.65	4955361.84	230.98	0	DEN	4000	61.8	14.3	0.0	0.0	0.0	67.3	21.3	-3.1	0.0	0.0	7.9	0.0	0.0	-17.3
40	626219.65	4955361.84	230.98	0	DEN	8000	55.7	14.3	0.0	0.0	0.0	67.3	76.1	-3.1	0.0	0.0	8.0	0.0	0.0	-78.2
44	626187.21	4955589.92	230.39	0	DEN	32	-74.6	18.0	0.0	0.0	0.0	65.7	0.0	-4.8	0.0	0.0	9.6	0.0	0.0	-127.1
44	626187.21	4955589.92	230.39	0	DEN	63	53.6	18.0	0.0	0.0	0.0	65.7	0.1	-4.8	0.0	0.0	9.6	0.0	0.0	1.0
44	626187.21	4955589.92	230.39	0	DEN	125	61.7	18.0	0.0	0.0	0.0	65.7	0.2	1.2	0.0	0.0	3.5	0.0	0.0	9.0
44	626187.21	4955589.92	230.39	0	DEN	250	71.2	18.0	0.0	0.0	0.0	65.7	0.6	-0.8	0.0	0.0	5.6	0.0	0.0	18.1
44	626187.21	4955589.92	230.39	0	DEN	500	73.6	18.0	0.0	0.0	0.0	65.7	1.1	-2.2	0.0	0.0	7.0	0.0	0.0	20.0
44	626187.21	4955589.92	230.39	0	DEN	1000	69.8	18.0	0.0	0.0	0.0	65.7	2.0	-2.2	0.0	0.0	7.1	0.0	0.0	15.2
44	626187.21	4955589.92	230.39	0	DEN	2000	67.0	18.0	0.0	0.0	0.0	65.7	5.3	-2.2	0.0	0.0	7.2	0.0	0.0	9.0
44	626187.21	4955589.92	230.39	0	DEN	4000	61.8	18.0	0.0	0.0	0.0	65.7	17.9	-2.2	0.0	0.0	7.3	0.0	0.0	-9.0
44	626187.21	4955589.92	230.39	0	DEN	8000	55.7	18.0	0.0	0.0	0.0	65.7	63.8	-2.2	0.0	0.0	7.7	0.0	0.0	-61.3
49	626202.04	4955414.18	230.73	0	DEN	32	-74.6	19.2	0.0	0.0	0.0	67.0	0.0	-5.0	0.0	0.0	9.8	0.0	0.0	-127.1
49	626202.04	4955414.18	230.73	0	DEN	63	53.6	19.2	0.0	0.0	0.0	67.0	0.1	-5.0	0.0	0.0	9.8	0.0	0.0	1.0
49	626202.04	4955414.18	230.73	0	DEN	125	61.7	19.2	0.0	0.0	0.0	67.0	0.3	0.5	0.0	0.0	4.3	0.0	0.0	8.9
49	626202.04	4955414.18	230.73	0	DEN	250	71.2	19.2	0.0	0.0	0.0	67.0	0.7	-1.6	0.0	0.0	6.4	0.0	0.0	18.0
49	626202.04	4955414.18	230.73	0	DEN	500	73.6	19.2	0.0	0.0	0.0	67.0	1.2	-3.0	0.0	0.0	7.8	0.0	0.0	19.9
49	626202.04	4955414.18	230.73	0	DEN	1000	69.8	19.2	0.0	0.0	0.0	67.0	2.3	-3.0	0.0	0.0	7.8	0.0	0.0	15.0
49	626202.04	4955414.18	230.73	0	DEN	2000	67.0	19.2	0.0	0.0	0.0	67.0	6.1	-3.0	0.0	0.0	7.8	0.0	0.0	8.4
49	626202.04	4955414.18	230.73	0	DEN	4000	61.8	19.2	0.0	0.0	0.0	67.0	20.6	-3.0	0.0	0.0	7.9	0.0	0.0	-11.4
49	626202.04	4955414.18	230.73	0	DEN	8000	55.7	19.2	0.0	0.0	0.0	67.0	73.5	-3.0	0.0	0.0	7.9	0.0	0.0	-70.4
53	626230.73	4955219.47	228.57	0	DEN	32	-74.6	19.7	0.0	0.0	0.0	68.5	0.0	-5.2	0.0	0.0	10.1	0.0	0.0	-128.5
53	626230.73	4955219.47	228.57	0	DEN	63	53.6	19.7	0.0	0.0	0.0	68.5	0.1	-5.2	0.0	0.0	10.3	0.0	0.0	-0.5
53	626230.73	4955219.47	228.57	0	DEN	125	61.7	19.7	0.0	0.0	0.0	68.5	0.3	0.1	0.0	0.0	5.3	0.0	0.0	7.0
53	626230.73	4955219.47	228.57	0	DEN	250	71.2	19.7	0.0	0.0	0.0	68.5	0.8	-2.0	0.0	0.0	8.1	0.0	0.0	15.4
53	626230.73	4955219.47	228.57	0	DEN	500	73.6	19.7	0.0	0.0	0.0	68.5	1.4	-3.3	0.0	0.0	10.4	0.0	0.0	16.2
53	626230.73	4955219.47	228.57	0	DEN	1000	69.8	19.7	0.0	0.0	0.0	68.5	2.7	-3.3	0.0	0.0	11.9	0.0	0.0	9.5
53	626230.73	4955219.47	228.57	0	DEN	2000	67.0	19.7	0.0	0.0	0.0	68.5	7.3	-3.3	0.0	0.0	13.9	0.0	0.0	0.2
53	626230.73	4955219.47	228.57	0	DEN	4000	61.8	19.7	0.0	0.0	0.0	68.5	24.6	-3.3	0.0	0.0	16.3	0.0	0.0	-24.7
53	626230.73	4955219.47	228.57	0	DEN	8000	55.7	19.7	0.0	0.0	0.0	68.5	87.8	-3.3	0.0	0.0	19.0	0.0	0.0	-96.7
57	626205.64	4955636.42	229.66	0	DEN	32	-74.6	15.7	0.0	0.0	0.0	65.2	0.0	-4.8	0.0	0.0	9.5	0.0	0.0	-128.9
57	626205.64	4955636.42	229.66	0	DEN	63	53.6	15.7	0.0	0.0	0.0	65.2	0.1	-4.8	0.0	0.0	9.5	0.0	0.0	-0.8
57	626205.64	4955636.42	229.66	0	DEN	125	61.7	15.7	0.0	0.0	0.0	65.2	0.2	5.9	0.0	0.0	0.0	0.0	0.0	6.1
57	626205.64	4955636.42	229.66	0	DEN	250	71.2	15.7	0.0	0.0	0.0	65.2	0.5	5.5	0.0	0.0	0.0	0.0	0.0	15.6
57	626205.64	4955636.42	229.66	0	DEN	500	73.6	15.7	0.0	0.0	0.0	65.2	1.0	0.4	0.0	0.0	4.5	0.0	0.0	18.2

Line Source, ISO 9613, Name: "Haul Trucks", ID: "HAUL_R1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
57	626205.64	4955636.42	229.66	0	DEN	1000	69.8	15.7	0.0	0.0	0.0	65.2	1.9	-0.4	0.0	0.0	5.3	0.0	0.0	13.5
57	626205.64	4955636.42	229.66	0	DEN	2000	67.0	15.7	0.0	0.0	0.0	65.2	4.9	-0.4	0.0	0.0	5.4	0.0	0.0	7.5
57	626205.64	4955636.42	229.66	0	DEN	4000	61.8	15.7	0.0	0.0	0.0	65.2	16.7	-0.4	0.0	0.0	5.7	0.0	0.0	-9.8
57	626205.64	4955636.42	229.66	0	DEN	8000	55.7	15.7	0.0	0.0	0.0	65.2	59.7	-0.4	0.0	0.0	6.2	0.0	0.0	-59.4
67	626261.16	4955120.56	225.50	0	DEN	32	-74.6	14.6	0.0	0.0	0.0	69.2	0.0	-5.2	0.0	0.0	10.2	0.0	0.0	-134.3
67	626261.16	4955120.56	225.50	0	DEN	63	53.6	14.6	0.0	0.0	0.0	69.2	0.1	-5.2	0.0	0.0	10.3	0.0	0.0	-6.3
67	626261.16	4955120.56	225.50	0	DEN	125	61.7	14.6	0.0	0.0	0.0	69.2	0.3	0.3	0.0	0.0	5.1	0.0	0.0	1.3
67	626261.16	4955120.56	225.50	0	DEN	250	71.2	14.6	0.0	0.0	0.0	69.2	0.9	-1.9	0.0	0.0	7.9	0.0	0.0	9.7
67	626261.16	4955120.56	225.50	0	DEN	500	73.6	14.6	0.0	0.0	0.0	69.2	1.6	-3.3	0.0	0.0	10.2	0.0	0.0	10.4
67	626261.16	4955120.56	225.50	0	DEN	1000	69.8	14.6	0.0	0.0	0.0	69.2	3.0	-3.3	0.0	0.0	11.7	0.0	0.0	3.8
67	626261.16	4955120.56	225.50	0	DEN	2000	67.0	14.6	0.0	0.0	0.0	69.2	7.9	-3.3	0.0	0.0	13.6	0.0	0.0	-5.9
67	626261.16	4955120.56	225.50	0	DEN	4000	61.8	14.6	0.0	0.0	0.0	69.2	26.7	-3.3	0.0	0.0	15.9	0.0	0.0	-32.3
67	626261.16	4955120.56	225.50	0	DEN	8000	55.7	14.6	0.0	0.0	0.0	69.2	95.4	-3.3	0.0	0.0	18.6	0.0	0.0	-109.7
71	626240.23	4955153.09	225.50	0	DEN	32	-74.6	16.9	0.0	0.0	0.0	69.1	0.0	-5.2	0.0	0.0	10.2	0.0	0.0	-131.8
71	626240.23	4955153.09	225.50	0	DEN	63	53.6	16.9	0.0	0.0	0.0	69.1	0.1	-5.2	0.0	0.0	10.4	0.0	0.0	-3.9
71	626240.23	4955153.09	225.50	0	DEN	125	61.7	16.9	0.0	0.0	0.0	69.1	0.3	0.1	0.0	0.0	5.5	0.0	0.0	3.6
71	626240.23	4955153.09	225.50	0	DEN	250	71.2	16.9	0.0	0.0	0.0	69.1	0.8	-2.0	0.0	0.0	8.3	0.0	0.0	11.9
71	626240.23	4955153.09	225.50	0	DEN	500	73.6	16.9	0.0	0.0	0.0	69.1	1.5	-3.4	0.0	0.0	10.8	0.0	0.0	12.4
71	626240.23	4955153.09	225.50	0	DEN	1000	69.8	16.9	0.0	0.0	0.0	69.1	2.9	-3.4	0.0	0.0	12.4	0.0	0.0	5.6
71	626240.23	4955153.09	225.50	0	DEN	2000	67.0	16.9	0.0	0.0	0.0	69.1	7.7	-3.4	0.0	0.0	14.5	0.0	0.0	-4.1
71	626240.23	4955153.09	225.50	0	DEN	4000	61.8	16.9	0.0	0.0	0.0	69.1	26.2	-3.4	0.0	0.0	17.0	0.0	0.0	-30.3
71	626240.23	4955153.09	225.50	0	DEN	8000	55.7	16.9	0.0	0.0	0.0	69.1	93.5	-3.4	0.0	0.0	19.7	0.0	0.0	-106.3

Line Source, ISO 9613, Name: "Shipments", ID: "SHIP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
20	626300.45	4955073.38	225.40	0	DEN	32	35.6	12.4	0.0	0.0	0.0	69.5	0.0	-5.3	0.0	0.0	10.2	0.0	0.0	-26.3
20	626300.45	4955073.38	225.40	0	DEN	63	44.8	12.4	0.0	0.0	0.0	69.5	0.1	-5.3	0.0	0.0	10.3	0.0	0.0	-17.4
20	626300.45	4955073.38	225.40	0	DEN	125	53.9	12.4	0.0	0.0	0.0	69.5	0.3	0.5	0.0	0.0	4.8	0.0	0.0	-8.7
20	626300.45	4955073.38	225.40	0	DEN	250	55.4	12.4	0.0	0.0	0.0	69.5	0.9	-1.8	0.0	0.0	7.5	0.0	0.0	-8.2
20	626300.45	4955073.38	225.40	0	DEN	500	64.8	12.4	0.0	0.0	0.0	69.5	1.6	-3.1	0.0	0.0	9.6	0.0	0.0	-0.3
20	626300.45	4955073.38	225.40	0	DEN	1000	70.0	12.4	0.0	0.0	0.0	69.5	3.1	-3.1	0.0	0.0	10.9	0.0	0.0	2.2
20	626300.45	4955073.38	225.40	0	DEN	2000	76.2	12.4	0.0	0.0	0.0	69.5	8.1	-3.1	0.0	0.0	12.6	0.0	0.0	1.6
20	626300.45	4955073.38	225.40	0	DEN	4000	80.0	12.4	0.0	0.0	0.0	69.5	27.5	-3.1	0.0	0.0	14.8	0.0	0.0	-16.2
20	626300.45	4955073.38	225.40	0	DEN	8000	75.9	12.4	0.0	0.0	0.0	69.5	98.0	-3.1	0.0	0.0	17.4	0.0	0.0	-93.3
23	626308.37	4955046.91	225.40	0	DEN	32	35.6	15.8	0.0	0.0	0.0	69.7	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-23.2
23	626308.37	4955046.91	225.40	0	DEN	63	44.8	15.8	0.0	0.0	0.0	69.7	0.1	-5.3	0.0	0.0	10.2	0.0	0.0	-14.1
23	626308.37	4955046.91	225.40	0	DEN	125	53.9	15.8	0.0	0.0	0.0	69.7	0.4	0.5	0.0	0.0	4.6	0.0	0.0	-5.5
23	626308.37	4955046.91	225.40	0	DEN	250	55.4	15.8	0.0	0.0	0.0	69.7	0.9	-1.7	0.0	0.0	7.2	0.0	0.0	-4.8
23	626308.37	4955046.91	225.40	0	DEN	500	64.8	15.8	0.0	0.0	0.0	69.7	1.7	-3.1	0.0	0.0	9.1	0.0	0.0	3.2
23	626308.37	4955046.91	225.40	0	DEN	1000	70.0	15.8	0.0	0.0	0.0	69.7	3.1	-3.1	0.0	0.0	10.1	0.0	0.0	6.0
23	626308.37	4955046.91	225.40	0	DEN	2000	76.2	15.8	0.0	0.0	0.0	69.7	8.3	-3.1	0.0	0.0	11.5	0.0	0.0	5.6
23	626308.37	4955046.91	225.40	0	DEN	4000	80.0	15.8	0.0	0.0	0.0	69.7	28.1	-3.1	0.0	0.0	13.5	0.0	0.0	-12.4
23	626308.37	4955046.91	225.40	0	DEN	8000	75.9	15.8	0.0	0.0	0.0	69.7	100.3	-3.1	0.0	0.0	15.9	0.0	0.0	-91.1
28	626317.61	4955016.05	225.40	0	DEN	32	35.6	14.3	0.0	0.0	0.0	69.9	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-24.9
28	626317.61	4955016.05	225.40	0	DEN	63	44.8	14.3	0.0	0.0	0.0	69.9	0.1	-5.3	0.0	0.0	10.2	0.0	0.0	-15.8
28	626317.61	4955016.05	225.40	0	DEN	125	53.9	14.3	0.0	0.0	0.0	69.9	0.4	0.6	0.0	0.0	4.4	0.0	0.0	-7.1
28	626317.61	4955016.05	225.40	0	DEN	250	55.4	14.3	0.0	0.0	0.0	69.9	0.9	-1.7	0.0	0.0	6.9	0.0	0.0	-6.4
28	626317.61	4955016.05	225.40	0	DEN	500	64.8	14.3	0.0	0.0	0.0	69.9	1.7	-3.0	0.0	0.0	8.6	0.0	0.0	1.9
28	626317.61	4955016.05	225.40	0	DEN	1000	70.0	14.3	0.0	0.0	0.0	69.9	3.2	-3.0	0.0	0.0	9.3	0.0	0.0	4.9
28	626317.61	4955016.05	225.40	0	DEN	2000	76.2	14.3	0.0	0.0	0.0	69.9	8.5	-3.0	0.0	0.0	10.4	0.0	0.0	4.6
28	626317.61	4955016.05	225.40	0	DEN	4000	80.0	14.3	0.0	0.0	0.0	69.9	28.9	-3.0	0.0	0.0	12.0	0.0	0.0	-13.6
28	626317.61	4955016.05	225.40	0	DEN	8000	75.9	14.3	0.0	0.0	0.0	69.9	103.1	-3.0	0.0	0.0	14.1	0.0	0.0	-94.0
61	626322.45	4954994.17	225.40	0	DEN	32	35.6	12.6	0.0	0.0	0.0	70.1	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-26.7
61	626322.45	4954994.17	225.40	0	DEN	63	44.8	12.6	0.0	0.0	0.0	70.1	0.1	-5.3	0.0	0.0	10.2	0.0	0.0	-17.6
61	626322.45	4954994.17	225.40	0	DEN	125	53.9	12.6	0.0	0.0	0.0	70.1	0.4	0.6	0.0	0.0	4.3	0.0	0.0	-8.8
61	626322.45	4954994.17	225.40	0	DEN	250	55.4	12.6	0.0	0.0	0.0	70.1	0.9	-1.7	0.0	0.0	6.8	0.0	0.0	-8.1
61	626322.45	4954994.17	225.40	0	DEN	500	64.8	12.6	0.0	0.0	0.0	70.1	1.7	-3.0	0.0	0.0	8.4	0.0	0.0	0.2
61	626322.45	4954994.17	225.40	0	DEN	1000	70.0	12.6	0.0	0.0	0.0	70.1	3.3	-3.0	0.0	0.0	8.9	0.0	0.0	3.4
61	626322.45	4954994.17	225.40	0	DEN	2000	76.2	12.6	0.0	0.0	0.0	70.1	8.7	-3.0	0.0	0.0	9.8	0.0	0.0	3.3
61	626322.45	4954994.17	225.40	0	DEN	4000	80.0	12.6	0.0	0.0	0.0	70.1	29.5	-3.0	0.0	0.0	11.2	0.0	0.0	-15.1
61	626322.45	4954994.17	225.40	0	DEN	8000	75.9	12.6	0.0	0.0	0.0	70.1	105.2	-3.0	0.0	0.0	13.1	0.0	0.0	-96.8
64	626323.96	4954980.57	225.40	0	DEN	32	35.6	9.6	0.0	0.0	0.0	70.2	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-29.9

Line Source, ISO 9613, Name: "Shipments", ID: "SHIP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
64	626323.96	4954980.57	225.40	0	DEN	63	44.8	9.6	0.0	0.0	0.0	70.2	0.1	-5.3	0.0	0.0	10.2	0.0	0.0	-20.8
64	626323.96	4954980.57	225.40	0	DEN	125	53.9	9.6	0.0	0.0	0.0	70.2	0.4	0.6	0.0	0.0	4.3	0.0	0.0	-12.0
64	626323.96	4954980.57	225.40	0	DEN	250	55.4	9.6	0.0	0.0	0.0	70.2	1.0	-1.7	0.0	0.0	6.7	0.0	0.0	-11.2
64	626323.96	4954980.57	225.40	0	DEN	500	64.8	9.6	0.0	0.0	0.0	70.2	1.8	-3.0	0.0	0.0	8.3	0.0	0.0	-2.8
64	626323.96	4954980.57	225.40	0	DEN	1000	70.0	9.6	0.0	0.0	0.0	70.2	3.3	-3.0	0.0	0.0	8.7	0.0	0.0	0.3
64	626323.96	4954980.57	225.40	0	DEN	2000	76.2	9.6	0.0	0.0	0.0	70.2	8.8	-3.0	0.0	0.0	9.5	0.0	0.0	0.3
64	626323.96	4954980.57	225.40	0	DEN	4000	80.0	9.6	0.0	0.0	0.0	70.2	29.9	-3.0	0.0	0.0	10.7	0.0	0.0	-18.2
64	626323.96	4954980.57	225.40	0	DEN	8000	75.9	9.6	0.0	0.0	0.0	70.2	106.6	-3.0	0.0	0.0	12.4	0.0	0.0	-100.7
76	626322.36	4954953.40	226.72	0	DEN	32	35.6	14.3	0.0	0.0	0.0	70.4	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-25.3
76	626322.36	4954953.40	226.72	0	DEN	63	44.8	14.3	0.0	0.0	0.0	70.4	0.1	-5.3	0.0	0.0	10.1	0.0	0.0	-16.2
76	626322.36	4954953.40	226.72	0	DEN	125	53.9	14.3	0.0	0.0	0.0	70.4	0.4	0.6	0.0	0.0	4.2	0.0	0.0	-7.4
76	626322.36	4954953.40	226.72	0	DEN	250	55.4	14.3	0.0	0.0	0.0	70.4	1.0	-1.7	0.0	0.0	6.5	0.0	0.0	-6.5
76	626322.36	4954953.40	226.72	0	DEN	500	64.8	14.3	0.0	0.0	0.0	70.4	1.8	-3.0	0.0	0.0	8.0	0.0	0.0	1.9
76	626322.36	4954953.40	226.72	0	DEN	1000	70.0	14.3	0.0	0.0	0.0	70.4	3.4	-3.0	0.0	0.0	8.2	0.0	0.0	5.3
76	626322.36	4954953.40	226.72	0	DEN	2000	76.2	14.3	0.0	0.0	0.0	70.4	9.1	-3.0	0.0	0.0	8.5	0.0	0.0	5.6
76	626322.36	4954953.40	226.72	0	DEN	4000	80.0	14.3	0.0	0.0	0.0	70.4	30.7	-3.0	0.0	0.0	9.1	0.0	0.0	-12.9
76	626322.36	4954953.40	226.72	0	DEN	8000	75.9	14.3	0.0	0.0	0.0	70.4	109.6	-3.0	0.0	0.0	10.1	0.0	0.0	-96.9
79	626314.07	4954928.89	228.18	0	DEN	32	35.6	14.2	0.0	0.0	0.0	70.7	0.0	-5.4	0.0	0.0	10.1	0.0	0.0	-25.7
79	626314.07	4954928.89	228.18	0	DEN	63	44.8	14.2	0.0	0.0	0.0	70.7	0.1	-5.4	0.0	0.0	10.1	0.0	0.0	-16.6
79	626314.07	4954928.89	228.18	0	DEN	125	53.9	14.2	0.0	0.0	0.0	70.7	0.4	0.6	0.0	0.0	4.2	0.0	0.0	-7.8
79	626314.07	4954928.89	228.18	0	DEN	250	55.4	14.2	0.0	0.0	0.0	70.7	1.0	-1.7	0.0	0.0	6.5	0.0	0.0	-6.9
79	626314.07	4954928.89	228.18	0	DEN	500	64.8	14.2	0.0	0.0	0.0	70.7	1.9	-3.1	0.0	0.0	7.9	0.0	0.0	1.6
79	626314.07	4954928.89	228.18	0	DEN	1000	70.0	14.2	0.0	0.0	0.0	70.7	3.5	-3.1	0.0	0.0	8.0	0.0	0.0	5.1
79	626314.07	4954928.89	228.18	0	DEN	2000	76.2	14.2	0.0	0.0	0.0	70.7	9.3	-3.1	0.0	0.0	8.1	0.0	0.0	5.4
79	626314.07	4954928.89	228.18	0	DEN	4000	80.0	14.2	0.0	0.0	0.0	70.7	31.6	-3.1	0.0	0.0	8.3	0.0	0.0	-13.3
79	626314.07	4954928.89	228.18	0	DEN	8000	75.9	14.2	0.0	0.0	0.0	70.7	112.6	-3.1	0.0	0.0	8.8	0.0	0.0	-98.9
82	626298.92	4954914.83	228.72	0	DEN	32	35.6	12.3	0.0	0.0	0.0	70.8	0.0	-5.4	0.0	0.0	10.1	0.0	0.0	-27.7
82	626298.92	4954914.83	228.72	0	DEN	63	44.8	12.3	0.0	0.0	0.0	70.8	0.1	-5.4	0.0	0.0	10.1	0.0	0.0	-18.6
82	626298.92	4954914.83	228.72	0	DEN	125	53.9	12.3	0.0	0.0	0.0	70.8	0.4	0.5	0.0	0.0	4.3	0.0	0.0	-9.8
82	626298.92	4954914.83	228.72	0	DEN	250	55.4	12.3	0.0	0.0	0.0	70.8	1.0	-1.8	0.0	0.0	6.6	0.0	0.0	-8.9
82	626298.92	4954914.83	228.72	0	DEN	500	64.8	12.3	0.0	0.0	0.0	70.8	1.9	-3.1	0.0	0.0	7.9	0.0	0.0	-0.4
82	626298.92	4954914.83	228.72	0	DEN	1000	70.0	12.3	0.0	0.0	0.0	70.8	3.6	-3.1	0.0	0.0	8.0	0.0	0.0	3.1
82	626298.92	4954914.83	228.72	0	DEN	2000	76.2	12.3	0.0	0.0	0.0	70.8	9.5	-3.1	0.0	0.0	8.0	0.0	0.0	3.3
82	626298.92	4954914.83	228.72	0	DEN	4000	80.0	12.3	0.0	0.0	0.0	70.8	32.2	-3.1	0.0	0.0	8.2	0.0	0.0	-15.7
82	626298.92	4954914.83	228.72	0	DEN	8000	75.9	12.3	0.0	0.0	0.0	70.8	114.8	-3.1	0.0	0.0	8.5	0.0	0.0	-102.8
85	626287.03	4954895.57	229.36	0	DEN	32	35.6	10.7	0.0	0.0	0.0	71.0	0.0	-5.4	0.0	0.0	10.2	0.0	0.0	-29.5
85	626287.03	4954895.57	229.36	0	DEN	63	44.8	10.7	0.0	0.0	0.0	71.0	0.1	-5.4	0.0	0.0	10.2	0.0	0.0	-20.4
85	626287.03	4954895.57	229.36	0	DEN	125	53.9	10.7	0.0	0.0	0.0	71.0	0.4	0.5	0.0	0.0	4.3	0.0	0.0	-11.6
85	626287.03	4954895.57	229.36	0	DEN	250	55.4	10.7	0.0	0.0	0.0	71.0	1.0	-1.8	0.0	0.0	6.6	0.0	0.0	-10.7
85	626287.03	4954895.57	229.36	0	DEN	500	64.8	10.7	0.0	0.0	0.0	71.0	1.9	-3.2	0.0	0.0	7.9	0.0	0.0	-2.2
85	626287.03	4954895.57	229.36	0	DEN	1000	70.0	10.7	0.0	0.0	0.0	71.0	3.7	-3.2	0.0	0.0	8.0	0.0	0.0	1.2
85	626287.03	4954895.57	229.36	0	DEN	2000	76.2	10.7	0.0	0.0	0.0	71.0	9.7	-3.2	0.0	0.0	8.0	0.0	0.0	1.3
85	626287.03	4954895.57	229.36	0	DEN	4000	80.0	10.7	0.0	0.0	0.0	71.0	32.9	-3.2	0.0	0.0	8.1	0.0	0.0	-18.2
85	626287.03	4954895.57	229.36	0	DEN	8000	75.9	10.7	0.0	0.0	0.0	71.0	117.5	-3.2	0.0	0.0	8.2	0.0	0.0	-107.0
88	626288.62	4954906.62	229.11	0	DEN	32	35.6	10.5	0.0	0.0	0.0	70.9	0.0	-5.4	0.0	0.0	10.1	0.0	0.0	-29.6
88	626288.62	4954906.62	229.11	0	DEN	63	44.8	10.5	0.0	0.0	0.0	70.9	0.1	-5.4	0.0	0.0	10.1	0.0	0.0	-20.5
88	626288.62	4954906.62	229.11	0	DEN	125	53.9	10.5	0.0	0.0	0.0	70.9	0.4	0.5	0.0	0.0	4.3	0.0	0.0	-11.7
88	626288.62	4954906.62	229.11	0	DEN	250	55.4	10.5	0.0	0.0	0.0	70.9	1.0	-1.8	0.0	0.0	6.6	0.0	0.0	-10.8
88	626288.62	4954906.62	229.11	0	DEN	500	64.8	10.5	0.0	0.0	0.0	70.9	1.9	-3.2	0.0	0.0	7.9	0.0	0.0	-2.3
88	626288.62	4954906.62	229.11	0	DEN	1000	70.0	10.5	0.0	0.0	0.0	70.9	3.6	-3.2	0.0	0.0	8.0	0.0	0.0	1.1
88	626288.62	4954906.62	229.11	0	DEN	2000	76.2	10.5	0.0	0.0	0.0	70.9	9.6	-3.2	0.0	0.0	8.0	0.0	0.0	1.3
88	626288.62	4954906.62	229.11	0	DEN	4000	80.0	10.5	0.0	0.0	0.0	70.9	32.6	-3.2	0.0	0.0	8.1	0.0	0.0	-18.0
88	626288.62	4954906.62	229.11	0	DEN	8000	75.9	10.5	0.0	0.0	0.0	70.9	116.2	-3.2	0.0	0.0	8.3	0.0	0.0	-105.9
93	626324.13	4954972.75	225.48	0	DEN	32	35.6	8.2	0.0	0.0	0.0	70.3	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-31.2
93	626324.13	4954972.75	225.48	0	DEN	63	44.8	8.2	0.0	0.0	0.0	70.3	0.1	-5.3	0.0	0.0	10.2	0.0	0.0	-22.2
93	626324.13	4954972.75	225.48	0	DEN	125	53.9	8.2	0.0	0.0	0.0	70.3	0.4	0.6	0.0	0.0	4.3	0.0	0.0	-13.4
93	626324.13	4954972.75	225.48	0	DEN	250	55.4	8.2	0.0	0.0	0.0	70.3	1.0	-1.7	0.0	0.0	6.7	0.0	0.0	-12.6
93	626324.13	4954972.75	225.48	0	DEN	500	64.8	8.2	0.0	0.0	0.0	70.3	1.8	-3.0	0.0	0.0	8.2	0.0	0.0	-4.2
93	626324.13	4954972.75	225.48	0	DEN	1000	70.0	8.2	0.0	0.0	0.0	70.3	3.4	-3.0	0.0	0.0	8.6	0.0	0.0	-1.0
93	626324.13	4954972.75	225.48	0	DEN	2000	76.2	8.2	0.0	0.0	0.0	70.3	8.9	-3.0	0.0	0.0	9.3	0.0	0.0	-0.9
93	626324.13	4954972.75	225.48	0	DEN	4000	80.0	8.2	0.0	0.0	0.0	70.3	30.1	-3.0	0.0	0.0	10.4	0.0	0.0	-19.5
93	626324.13	4954972.75	225.48	0	DEN	8000	75.9	8.2	0.0	0.0	0.0	70.3	107.5	-3.0	0.0	0.0	12.0	0.0	0.0	-102.5
97	626323.66	4954968.15	225.59	0	DEN	32	35.6	4.1	0.0	0.0	0.0	70.3	0.0	-5.3	0.0	0.0	10.1	0.0	0.0	-35.4

Line Source, ISO 9613, Name: "Shipments", ID: "SHIP"																			
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
97	626323.66	4954968.15	225.59	0	DEN	63	44.8	4.1	0.0	0.0	0.0	70.3	0.1	-5.3	0.0	0.0	10.1	0.0	0.0	-26.3
97	626323.66	4954968.15	225.59	0	DEN	125	53.9	4.1	0.0	0.0	0.0	70.3	0.4	0.6	0.0	0.0	4.3	0.0	0.0	-17.5
97	626323.66	4954968.15	225.59	0	DEN	250	55.4	4.1	0.0	0.0	0.0	70.3	1.0	-1.7	0.0	0.0	6.6	0.0	0.0	-16.7
97	626323.66	4954968.15	225.59	0	DEN	500	64.8	4.1	0.0	0.0	0.0	70.3	1.8	-3.0	0.0	0.0	8.2	0.0	0.0	-8.3
97	626323.66	4954968.15	225.59	0	DEN	1000	70.0	4.1	0.0	0.0	0.0	70.3	3.4	-3.0	0.0	0.0	8.5	0.0	0.0	-5.0
97	626323.66	4954968.15	225.59	0	DEN	2000	76.2	4.1	0.0	0.0	0.0	70.3	8.9	-3.0	0.0	0.0	9.1	0.0	0.0	-5.0
97	626323.66	4954968.15	225.59	0	DEN	4000	80.0	4.1	0.0	0.0	0.0	70.3	30.3	-3.0	0.0	0.0	10.2	0.0	0.0	-23.5
97	626323.66	4954968.15	225.59	0	DEN	8000	75.9	4.1	0.0	0.0	0.0	70.3	108.0	-3.0	0.0	0.0	11.7	0.0	0.0	-106.9

APPENDIX B
CURRICULUM VITAE

JOHN EMELJANOW, P.Eng.

Principal Acoustical Engineer

Mr. Emeljanow (John) has been employed with Valcoustics Canada Ltd. for over 28 years. He is a Principal Engineer, a Designated Consulting Engineer with the Professional Engineers of Ontario, a graduate of the Ministry of the Environment's Acoustics Technology in Land Use Planning Course and has given evidence as an expert witness before the Ontario Municipal Board, dealing with environmental acoustics issues in land use planning. John has acted as project manager on a number of major architectural and environmental projects. His responsibilities include noise/vibration measurement, analysis, design computations, and report preparation. In addition, John was an active contributor to the acoustics section of the Architectural Design Standards for Ontario Courthouses prepared for the Ministry of the Attorney General.

Architectural acoustics involving the interaction of sound and architectural elements within a space to obtain the desired acoustical environment. This involves control of reverberation, ambient sound level, location of sound absorbing and sound reflecting surfaces as well as isolation of sound to and from adjacent spaces. Representative projects are: Niagara Convention Centre; Durham Consolidated Courthouse; Brampton Consolidated Courthouses; Upper Canada College Expansion, Toronto; Toronto Stock Exchange Renovations (The Design Exchange); Sunnybrook Health Science Centre Expansion and Renovation, Toronto; Metro Convention Centre Expansion, Toronto; Canary Wharf (DS5), London; Sudbury Regional Hospital; and GTAA Infield Development, Mississauga.

Environmental noise and vibration studies to determine impact of ground and air transportation and stationary sources of sound on adjacent land use, both existing and proposed, as well as selection and analysis of noise mitigation measures, including sound barriers, architectural elements, and operational techniques. Projects are prepared for private and government sectors, involving residential, industrial and commercial development. Representative projects include: Walker Brothers Quarry, Thorold; Keele Valley Landfill Vertical Expansion, Maple; Canadian National Railway Lands Redevelopment, Toronto; The Woodbridge Expansion Area, Vaughan; Rimply Manufacturing Plant, Newmarket; Honda Canada Manufacturing Minivan Plant, Alliston; Sheppard Subway, Toronto; and Highway 11, Burk's Falls to Powassin.

Mechanical system noise and vibration analyses to control the impact of air-borne and structure-borne sound from mechanical equipment on adjacent spaces through the design of demising surfaces, as well as the control of noise generated and transmitted through HVAC systems. Representative projects include: the New Princess Margaret Hospital, Toronto; National Trade Centre, Toronto; IBM Facility for Software Development, Markham; Niagara College – Glendale Campus, Niagara Falls; The American School, Shanghai; Guelph General Hospital; and Xiamen Conference Centre, China.

EDUCATION:

B.Eng.

McMaster University, June 1989, Mechanical Engineering

Course on Noise Control in Land Use Planning; Ministry of the Environment and Energy, Toronto, June 1989

PROFESSIONAL AFFILIATION:

Registered Professional Engineer, Professional Engineers of Ontario

Designated Consulting Engineer, Professional Engineers of Ontario

PUBLICATIONS & PRESENTATIONS:

- "A Technique for Comparing Alternative Transportation Corridor Alignments Based on Noise Impact", presented at Inter-Noise 92, Toronto, Ontario, July 1992.
- "Environmental Noise Aspects of Landfill Site Selection", Canadian Acoustics, Vol. 21, No. 3, September 1993.
- "Acoustical Challenge of Quarry Design", Canadian Acoustics, Vol. 22, No. 3, September 1994.
- "NPC-300 Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning", Seminar for Municipalities, December 9, 2013 (co-presenter).
- "Environmental Acoustics in Land Use Planning", Seminar in Acoustics for the City of Mississauga, June 24-26, 2014 (co-presenter).
- "Environmental Acoustics in Land Use Planning", Seminar in Acoustics for the City of London, July 9-11, 2014 (co-presenter).
- "Workshop: Noise and Vibration for New Development in Proximity to Railway Operations", Prepared for the FCM-RAC Proximity Steering Committee, June 26, 2015 (co-presenter).

APPENDIX C
NOISE MITIGATION PRODUCT

Atlas Copco Surface Drill Rigs

SmartRig™ ROC D7C, D9C and F9C

Smart up your drilling business

SmartRig ROC D7C hole range 64 – 115 mm (2½ – 4½″)
SmartRig ROC D9C hole range 76 – 115 mm (3 – 4½″)
SmartRig ROC F9C hole range 89 – 127 mm (3½ – 5″)

Atlas Copco

Drill smarter
with SmartRig

Thanks to the SmartRig™ from Atlas Copco you can now drill smarter holes. Each hole you drill saves you time and earns you money.

With its high shift capacity, low energy consumption and innovative modules that improve productivity, we can safely say that SmartRig is a ground-breaking rig. The options available make it one of the quietest running rigs of its kind, with greatly reduced setup time and efficient high precision drilling – under any conditions.

The unique SmartRig features all add up to a set of tools that enable you to optimize operations, to maintain your competitive edge and maximize profitability. Smarter drilling with SmartRig.

SmartRig gives you:

- High productivity
- Outstanding safety & ergonomics
- Environmental friendliness
- Excellent documentation of the work progress

Silenced
The Silenced SmartRig's noise level is approximately 10 dB (A) below that of other rigs on the market, making it one of the world's quietest running rigs.

ROC Manager
Planning & analysis of drilling and blasting. Design drill patterns, log deviation data and analyse MWD (Measure While Drilling) results.

Hole navigation
For high precision drilling, fast set-up, monitoring, project integration and control.

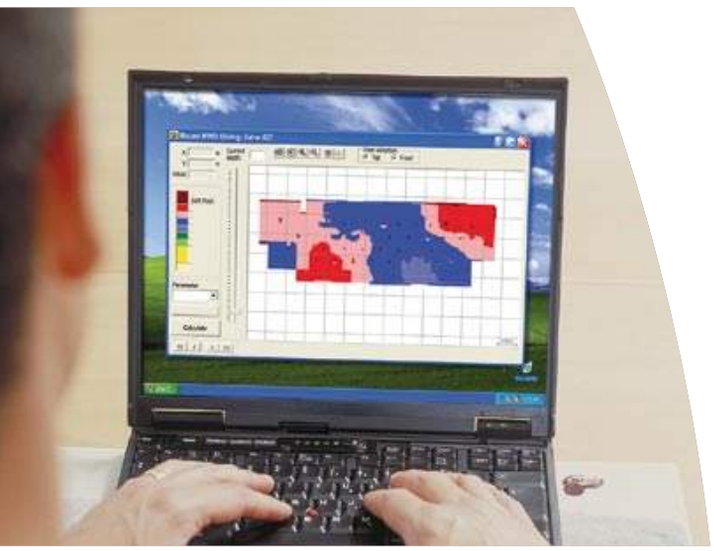
SMARTRIG™

SmartRig modules

Hole navigation for accuracy, fast set-up and high precision drilling

The **Hole Navigation System** adds a new dimension to the extensive automation already available on a SmartRig to complete pre-planned drill patterns after initial set-up. All drilling functions are monitored and controlled to provide a record of hole alignment, burden and spacing. Drill rig operations can also be integrated with other equipment such as dozers, dumpers and graders, using the same set-out input data on a common computer system used at the project site.

The precision of the navigation system optimizes drilling and blasting results, improves fragmentation and decreases the amount of explosives needed, substantially lowering your overall production costs. By using hole navigation, you will also profit from reduced setup time and efficient high precision drilling – under any weather conditions. The net result is a significant increase in rig utilization and substantial savings in both time and money.



Outstanding planning and control with ROC Manager

The **ROC Manager** is, together with the **Hole Navigation System** (HNS), simply put, your best friend when it comes to planning and control of the drilling and blasting operations. ROC Manager runs on a standard PC and can be used to consolidate data about multiple rigs at multiple sites. You can use ROC Manager to design drill patterns and analyze drilling results.

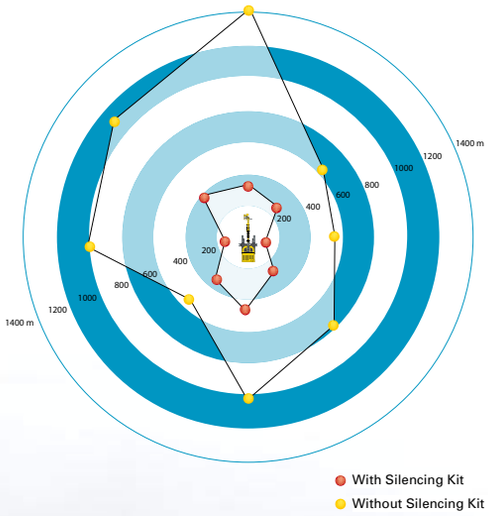
Reduced set-up time and increased efficiency with Automatic Feed Alignment & Rod Adding System

SmartRig's **Automatic Feed Alignment** reduces set-up time and cancels out operator error by setting the feed to predefined angles at the touch of a button. The **Automatic Rod Adding System** enables the operator to drill automatically to a given depth, while carrying out other duties such as maintenance checks or grinding bits. The net result is a significant increase – about 10-15 % – in rig utilization. Operation is easy and setup time is reduced.

The rig can be equipped with a laser plane receiver that gives you an accurate reference height. All holes can then be drilled to exactly the same depth. There is no need for sight rods or manual marking of bench heights. The advantages of accurately drilling all holes to the same depth are considerable. Overdrilling is not necessary and the costs for secondary breaking, crushing, loading and haulage are considerably reduced.

Drill anywhere at anytime with the Silenced SmartRig

With a noise level approximately 10 dB (A) below that of other rigs on the market, the **Silenced SmartRig** is one of the worlds quietest running rigs. A perfect choice for civil engineering work sites in restricted urban areas. The advanced silencing system consists of several components which work to reduce the overall noise level. The Silenced version is available for SmartRig ROC D7C and D9C.



Noise level with and without Silencer
The noise mat shows the breakthrough difference of sound level with and without Silencer, and shows that the Silenced SmartRig can work up to 1 km nearer to settlements and buildings. The reference sound level is 55 dB (A). This is a common max sound level (in northern Europe) when drilling close to urban areas. The area should be used as an indication only.

More ground-breaking features ahead

At Atlas Copco, we are continuously innovating to improve your productivity. More additional options to the SmartRig will be available in the future. Keep ahead of the competition with SmartRig.

No matter how you finally decide to equip your SmartRig, every SmartRig delivered from us at Atlas Copco comes with highly intelligent standard equipment. Innovative equipment that has been developed with a focus on improving productivity.

More power with less fuel

The SmartRig delivers the exact right amount of power for each phase of the drilling operation from its new Stage 3/Tier III engine. This makes it possible to reduce fuel consumption by up to 30 % compared to similar rigs on the market.

Increased drilling efficiency

Using the SmartRig **Rock Drill Control System**, the service life length of drilling consumables, such as the shank adapter and drill steel, increases by more than 20 per cent. The system works by adjusting drilling power to suit the ground conditions, with the three vital control parameters being rotation pressure, drill dampening pressure and penetration rate.

The latter two are factory-set as default values according to the basic rock types: hard, medium or soft. For harder rock, the power is increased automatically. If voids are encountered, the speed is automatically reduced. For softer rock, different levels of control pressures are set. In addition to better economy in consumables, the risk of drill strings getting stuck in blast holes is reduced, resulting in increased rig availability and overall drilling productivity.

Superb operator ergonomics and safety

With the SmartRig control system, electrical signals are generated to control the hydraulic valves. This introduces the concept of a “dry cab”, with no hydraulic pipe work and gauges, considerably reducing both the noise for the operator and the risk of oil leakage. Control gauges and instruments are replaced by a display unit. This releases space in the cab, increases visibility, and improves operator ergonomics.

Easy maintenance & environmentally friendly

With 30 % less hoses and hose meters there is less need for maintenance and less risk of spillage, making the SmartRig environmentally friendly. Service is trouble-free with easy fault finding and self diagnostics.

The SmartRig™ family

The SmartRig comes in three different power classes; all with their unique characteristics, but all featuring the intelligence and efficiency of the SmartRig concept. Contact your local Atlas Copco dealer now for a smarter drilling business.

SmartRig ROC D7C

A crawler rig with power, flexibility and excellent rough terrain capabilities. Characteristics that elevate surface drilling to impressive new levels of quality, productivity and cost effectiveness. Ideal for construction and quarrying.

SmartRig ROC D9C

All the advantages of the SmartRig ROC D7C, but with a more powerful rock drill and more flushing air. A perfect choice when taking assignments focused on high productivity.

SmartRig ROC F9C

A powerful tophammer rig with SmartRig intelligence. Its top-of-the-range power and remarkable versatility make the SmartRig ROC F9C ideal for large-scale quarries and construction work.

Quick facts SmartRig ROC D7C, D9C and F9C

Main application area:	☐ DIMENSION STONE INDUSTRY	☒ CONSTRUCTION	☒ AGGREGATE QUARRIES
	☒ LIMESTONE QUARRIES *(mainly ROC F9C)*	☐ SELECTIVE MINING	☐ OPEN PIT MINING
Drilling method:	☒ TOPHAMMER	☐ DOWN-THE-HOLE	☐ COPROD
Rock drill:	ROC D7C COP 1840	ROC D9C COP 2560	ROC F9C COP 2560
Drill steel:	ROC D7C T38, T45, T51	ROC D9C T45, T51	ROC F9C T45, T51
Hole diameter:	64 mm (2½ ") – ROC D7C – 115 mm (4½")	76 mm (3 ") – ROC D9C – 115 mm (4½")	89 mm (3½") – ROC F9C – 127 mm (5")
Maximum hole depth:	28 m (92')		
Engine power: rating at 2200 rpm (rpm varies for different type of rigs)	ROC D7C 168 kW (225 HP)	ROC D9C 168 kW (225 HP)	ROC F9C 224 kW (300 HP)
Rock drill power output:	ROC D7C 20 kW (26,8 HP)	ROC D9C 25 kW (33,5 HP)	ROC F9C 25 kW (33,5 HP)

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